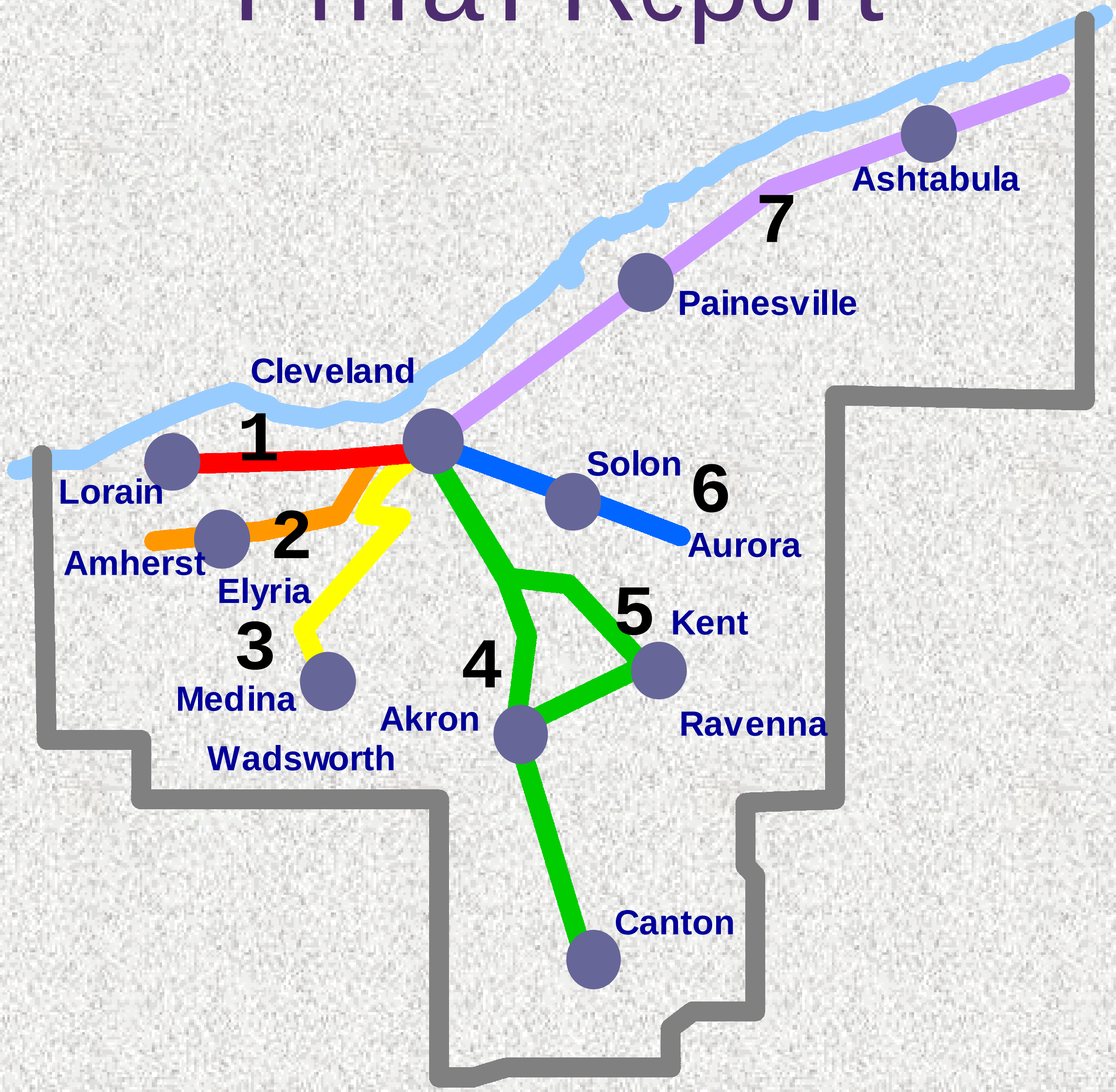
NEORail - Phase II
Final Report



December 2001

Submitted to NOACA by PARSONS BRINCKERHOFF for the Northeast Ohio Commuter Rail Feasibility Study – Phase II

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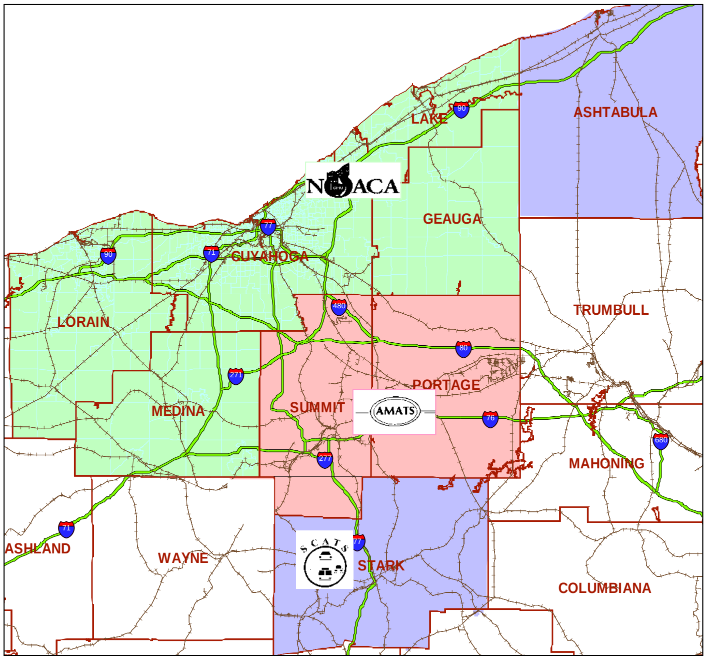
EXECUTIVE SUMMARY

Introduction

The Northeast Ohio Commuter Rail Feasibility Study (NEORail) was a two phase study conducted to assess the potential for regional commuter rail service in Northeast Ohio. The study focused on nine counties in the jurisdictions of three metropolitan planning organizations (NOACA, for the Cleveland-Lorain area; AMATS, for the Akron-Kent area, and SCATS, for the Canton-Massillon area). NOACA oversaw the study through its Commuter Rail Advisory Committee (CRAC). Parsons Brinckerhoff, a transportation consulting firm, performed the technical analysis, supported by Urban Conservation and Design, which conducted the public involvement portion of the study.

NEORail II Study Area

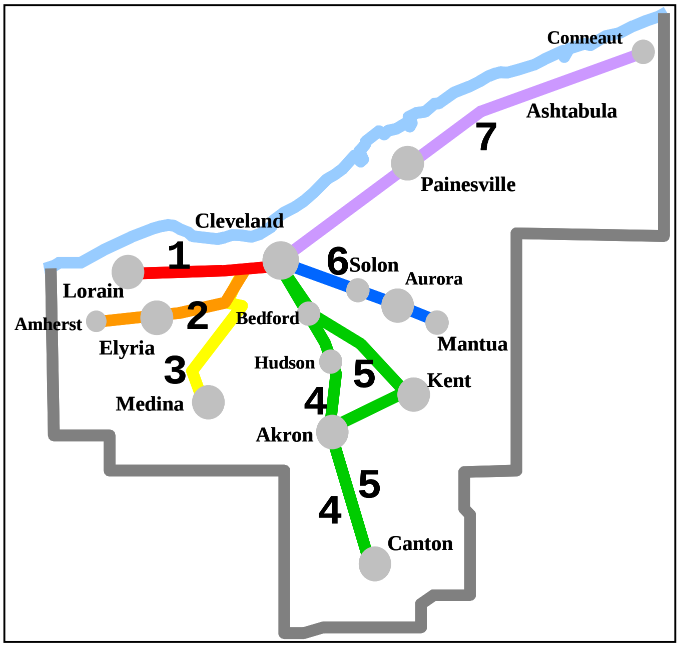


Phase I

The first phase of the study, which began in November 1997, identified ten potential commuter rail corridors based on an analysis of 39 rail alignments. The study evaluated these ten corridors in terms of ridership potential, cost-effectiveness, impacts on freight service and other factors. The analysis showed that commuter rail service was potentially feasible in seven of the ten corridors. These seven corridors are:

1. Lake West Corridor: Cleveland–Lorain
2. West Corridor: Cleveland–Elyria–Amherst
3. Southwest Corridor: Cleveland–Medina
4. South Corridor: Canton–Akron–Cleveland via Hudson
5. South Corridor: Canton–Akron–Cleveland via Kent
6. East Corridor: Cleveland–Solon–Aurora–Mantua
7. Lake East Corridor: Cleveland–Painesville–Ashtabula–Conneaut

Potential Commuter Rail Routes



Phase II

The second phase of the study refined cost/benefit estimates and developed more detailed operating plans, a phasing schedule and options for implementing, governing, and operating commuter rail in Northeastern Ohio.

The CRAC developed a set of goals and objectives to guide the study and structure the decision-making process. These goals included identifying feasible rail corridors, supporting the regional transportation plans of the three MPOs, and providing information necessary for decision-makers to assess the feasibility and potential benefits of commuter rail. The goals closely parallel NOACA's goals for the region and the goals of the three MPOs to promote efficiency and effectiveness in transportation infrastructure development.

The study was closely coordinated with the Canton-Akron-Cleveland Major Investment Study (CAC MIS), which was analyzing commuter rail as an option for serving travel needs in the travel corridor connecting those three cities. The study was also coordinated with other regional transportation studies.

The technical products of the study and the results of the public and stakeholder involvement process were considered by the members of the CRAC, which made recommendations regarding implementation and further study. These recommendations will be considered by the MPO governing bodies, which will determine whether to take further steps toward development of commuter rail.

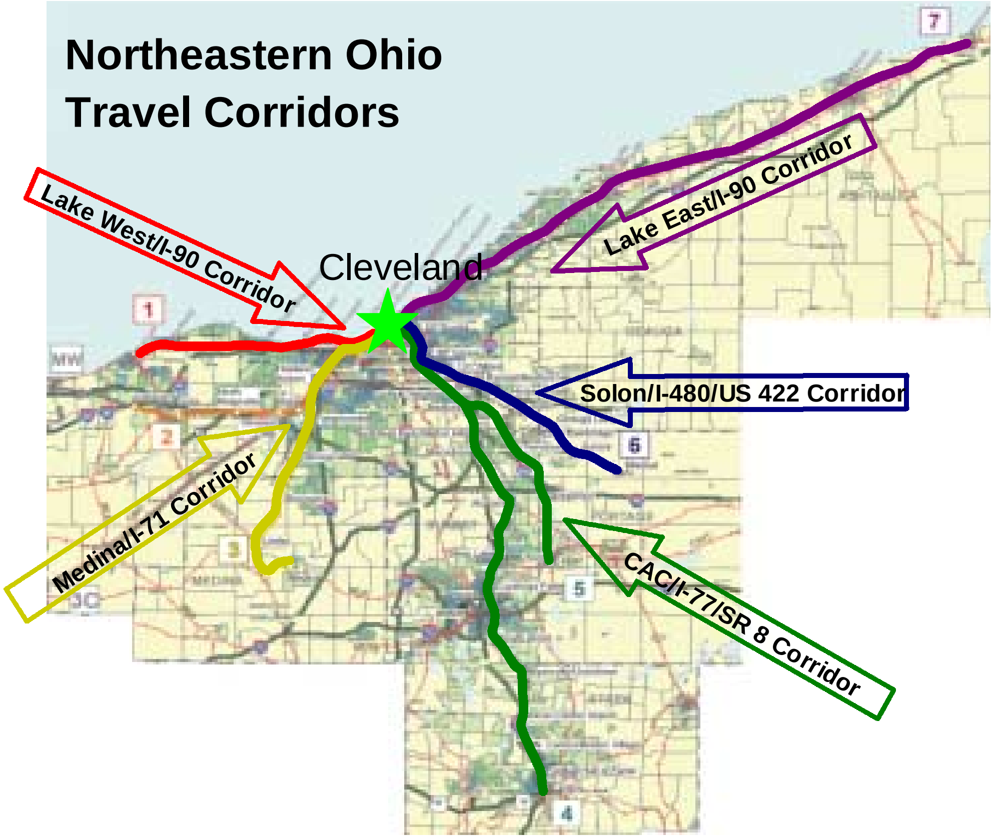
The NEORail study found that regional commuter rail service in Northeastern Ohio is potentially feasible and could provide both local and regional benefits. Commuter rail would support the downtown area of Cleveland and Akron, two of the region's primary employment locations, and would provide an anchor for potential redevelopment of other older developed areas. Commuter rail might also focus land development around stations, slowing urban sprawl; and would provide an example of inter-regional cooperation. Decision-makers must now consider whether the potential benefits of the system outweigh the financial costs and decide whether to take the next steps toward implementation.

If commuter rail is to be developed in the northeastern Ohio region, the next steps toward development rail might include an alternatives analysis (AA) or major Investment Study (MIS) in one or more of the NEORail routes to achieve eligibility for federal New Starts funding. Further analysis and refining of the governance and funding options will be required. Further dialogue with the freight railroads that own the rail rights-of-way also will be required to facilitate potential implementation. The outcome of other regional transportation and land use planning studies and initiatives will also have bearing on the development of commuter rail.

Regional Trends and Transportation Patterns

Analysis of regional projections indicate that population and employment in the region is not expected to grow significantly over the next 25 years, but rather will disperse further from Cleveland and the other central cities in the study area. Downtown Cleveland, the primary focus of the NEORail network, will remain the region's main employment center, but it is projected to decline in relative terms, with most new jobs being distributed in many smaller suburban locations.

The NEORail study analyzed the travel markets in the five major regional transit corridors served by the seven rail corridors. Analysis indicated that about 60% of the approximately 110,000 persons who are expected to commute to downtown Cleveland in 2025 could be served by one of the seven NEORail corridors. Many of those not served would live in neighborhoods too near to downtown to be served effectively by commuter rail.



If these projections prove to be correct, it will be increasingly difficult for commuter rail—or any form of public transportation—to serve the area. However, these predictions are based on past regional trends. The development of the commuter rail network, if supported by changes to land use planning and zoning, could tend to concentrate development in the central cities served by the system and around station areas in the suburbs, helping to support the goals of the regional transportation plans.

Mixing Passenger and Rail Freight Traffic

The NEORail study area is served by three mainline railroads: Norfolk Southern (NS), CSX Transportation and the Wheeling & Lake Erie Railroad. Every one of the seven potential NEORail routes include at least some track used by one of these three railroads.

The Conrail breakup and the distribution of its assets to NS and CSX has made the Cleveland area a focal point for east-west traffic for both railroads, serving volumes of over 50 trains per day on some routes. The Conrail breakup also resulted in major shifts in the volume of freight traffic between some of the lines. Some segments are seeing many more trains per day (such as the NS Chicago Line through Berea and the NS Cleveland Line between Bedford and Hudson) while other segments are seeing many fewer trains (such as the former Nickel Plate Line through Lakewood and Lorain). Both CSX and NS project future increases in freight traffic in the Cleveland area, although traffic patterns are still evolving two years after the Conrail breakup.

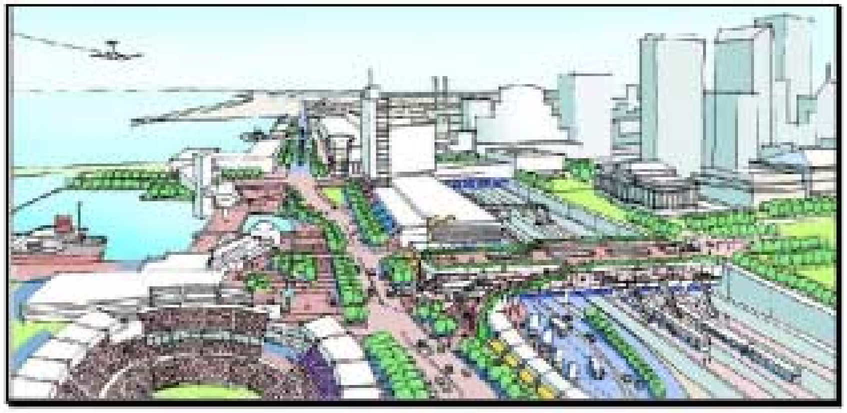
Introducing commuter rail service onto existing mainline freight tracks would have significant impacts on rail freight operations, particularly at numerous bottleneck locations throughout the region. Thus, it is unlikely that the freight railroads that control key segments of each of the seven routes would permit commuter rail operation on their rights of way without significant capital investment to address bottlenecks in the rail system.

Analyzing Commuter Rail Operations

The NEORail Study estimated costs and ridership at three levels of regional rail service on each of the seven potential rail lines. These levels ranged from a basic service—a few trips per day, during peak travel periods and only in the peak (Cleveland-oriented) direction— to a higher level of service with trains operating at approximately 30-minute intervals during the peak periods, and including significant reverse-commute and mid-day service. Estimates of the number of trainsets (assumed to be an engine plus three coaches) that would be required to operate these levels of service, as well as capital and operating costs and ridership levels, were developed for each of these service levels for each route as part of the analysis.

The higher levels of service would be more attractive to passengers, resulting in higher ridership allowing for more efficient use of the passenger rail system. However, the higher levels of service also would entail higher capital and operating costs: capital costs for infrastructure such as additional track, passing sidings and bridge structures, and operating costs associated with a higher number of trainsets in service.

Downtown Cleveland



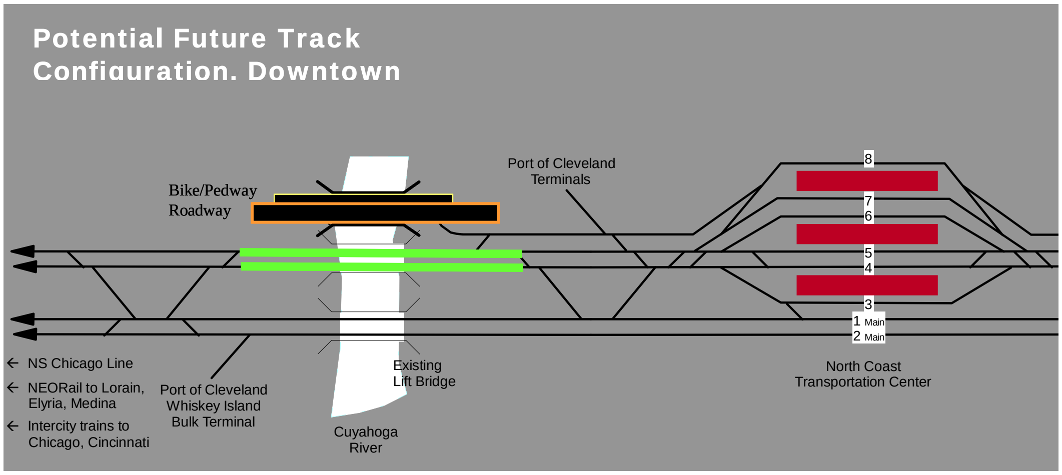
The study assumed that the system's hub in downtown Cleveland would be the proposed North Coast Transportation Center, located below the Mall at Cleveland's lakefront between West 3rd and East 9th Streets. This site was originally identified in the Intermodal Hub Study, which evaluated alternative sites for a downtown intermodal passenger transportation center. The NEORail Study reaffirmed this site as the preferred station location, which offers integration with GCRTA's Waterfront Transit Line, Amtrak service, buses and auto traffic. The Intermodal Hub site is also located adjacent to many downtown uses, including the Browns Stadium, Rock-and-Roll Hall of Fame and Museum, Great Lakes Science Center, downtown businesses and government buildings.

The study also identified the former East 26th Street Yard, alongside the CSX tracks east of downtown, as the preferred location for a downtown train storage and maintenance yard.

Increasing Capacity Through Cleveland

The single, two-track lift bridge crossing the Cuyahoga River is a major choke point in the rail system through Cleveland that limits the capacity of the system to accommodate commuter rail.

Long-term options for opening up the bottleneck at the Cuyahoga include building a new high-level bridge, replacing the existing lift bridge with a larger one, and adding additional bridges to supplement the existing one. Each of these options has its merits and drawbacks. These options would be expensive but would add significant capacity to the rail network for freight and passenger use.


Potential Future Track Configuration, Downtown
Bike/Pedway
Roadway
Port of Cleveland Terminals
8
7
6
5
4
3
1 Main
2 Main
← NS Chicago Line
← NEORail to Lorain, Elyria, Medina
← Intercity trains to Chicago, Cincinnati
Port of Cleveland Whiskey Island Bulk Terminal
Existing Lift Bridge
Cuyahoga River
North Coast Transportation Center

A shorter term and potentially less expensive option, the proposed Erie-Nickel Plate Connection, would provide an alternative route through Cleveland for many NS freight trains, creating a double track route that would allow traffic to cross on the Nickel Plate bridge over the Cuyahoga River south of downtown Cleveland. The project would benefit all of the potential NEORail routes by diverting freight trains away from downtown Cleveland and the Lakefront. This option would defer or possibly eliminate the need for a new Cuyahoga River bridge at the lakefront.

Downtown Akron

Several rail lines converge, intersect and cross each other in the vicinity of downtown Akron. There are three potential sites for a commuter rail station serving downtown Akron:

- Quaker Square, on the CSX Newcastle Subdivision (the current Amtrak station site)
- North Main Street, on the Wheeling & Lake Erie Railroad (former station site)
- North Howard Street, on the Cuyahoga Valley Scenic Railroad alignment (site of the recently-constructed station for the scenic railroad).

Each of the three sites has advantages and disadvantages. A site for storage and maintenance of commuter rail trains also is required at Akron, directly accessible to the station. As of the date of this report, a preferred station site had not been identified, and the City of Akron had indicated a willingness to consider all three options. The siting of the Akron station will be determined at a later stage of the implementation process, perhaps as part of the Canton-Akron-Cleveland major investment study, and will depend upon factors such as local policy and development priorities in the City of Akron and the extent to which agreement can be reached with CSX Transportation concerning commuter rail access onto or across their right-of-way. A feasible railroad alignment and operating plan can be developed for any of the three sites.

For purposes of analysis in NEORail Phase II, the Quaker Square site is assumed to be the location of the Akron commuter rail station. The plan and cost estimates allow for the construction of commuter rail tracks and station facilities that are operationally independent of the CSX mainline traffic, including a rail flyover from the Hudson branch line at Arlington Street and new dedicated commuter tracks parallel to the CSX main tracks from Arlington Street to Quaker Square. The station is assumed to consist of a new island platform with two platform tracks (separate from but adjacent to the current Amtrak station), with a new pedestrian bridge accessing both platforms. It may be possible to reduce the implementation cost of commuter rail in this corridor by selecting one of the alternative station locations, entering into an agreement with CSX Transportation to permit commuter trains to cross the freight mainline at grade, or constructing a more modest station and storage/maintenance facility.

Evaluating the Corridors

The seven NEORail corridors were evaluated against criteria set by the CRAC. The seven evaluation criteria included: ridership, costs, cost-effectiveness (cost per rider), coordination with the freight railroads, development potential around stations, local political and financial support, and consistency with regional goals. Overall, Corridors 1 (Lorain) and 6 (Aurora) scored highest in terms of all seven of the evaluation criteria. The following table summarizes the results of the comparison.

Summary of Evaluation Results for Individual Corridors

	1 Lake West Lorain	2 West Elyria	3C South West Medina	4 South Via Hudson	5 South Via Kent	6 East Aurora	7 Lake East Ashtabula
Effectiveness (ridership)	**Medium-High**	**Low-Medium**	**Low**	**High**	**High**	**Medium-High**	**Medium**
Capital Cost	**Low Cost**	**High Cost**	**Medium-High Cost**	**Medium-High Cost**	**Medium-High Cost**	**Low Cost**	**Medium Cost**
O&M Cost	**Medium Cost**	**Medium Cost**	**Medium Cost**	**Medium-High Cost**	**Medium-High Cost**	**Medium Cost**	**Medium-High Cost**
Cost-effectiveness	**High**	**Low**	**Low**	**Medium**	**Medium**	**High**	**Medium**
Railroad cooperation	**Medium-High**	**Low-Medium**	**Low-Medium**	**Medium**	**Medium-High**	**High**	**Low-Medium**
Development potential	**Medium**	**High**	**Low**	**High**	**High**	**Medium**	**Low-Medium**
Regional goals	**Medium-High**	**Medium**	**Low-Medium**	**Medium-High**	**Medium-High**	**High**	**Medium**
Local support: (political, financial)	**Mixed**	**Good**	**Low at this site**	**Mixed**	**Mixed**	**May be gaining**	**Good**

Recommendations

On January 17, 2001, CRAC considered the results of the corridor analysis in a “Tiering Workshop.” Members of the CRAC, NOACA staff and consultants discussed the analysis results and developed a tiering schedule in which the full commuter rail network could be developed in three phases.

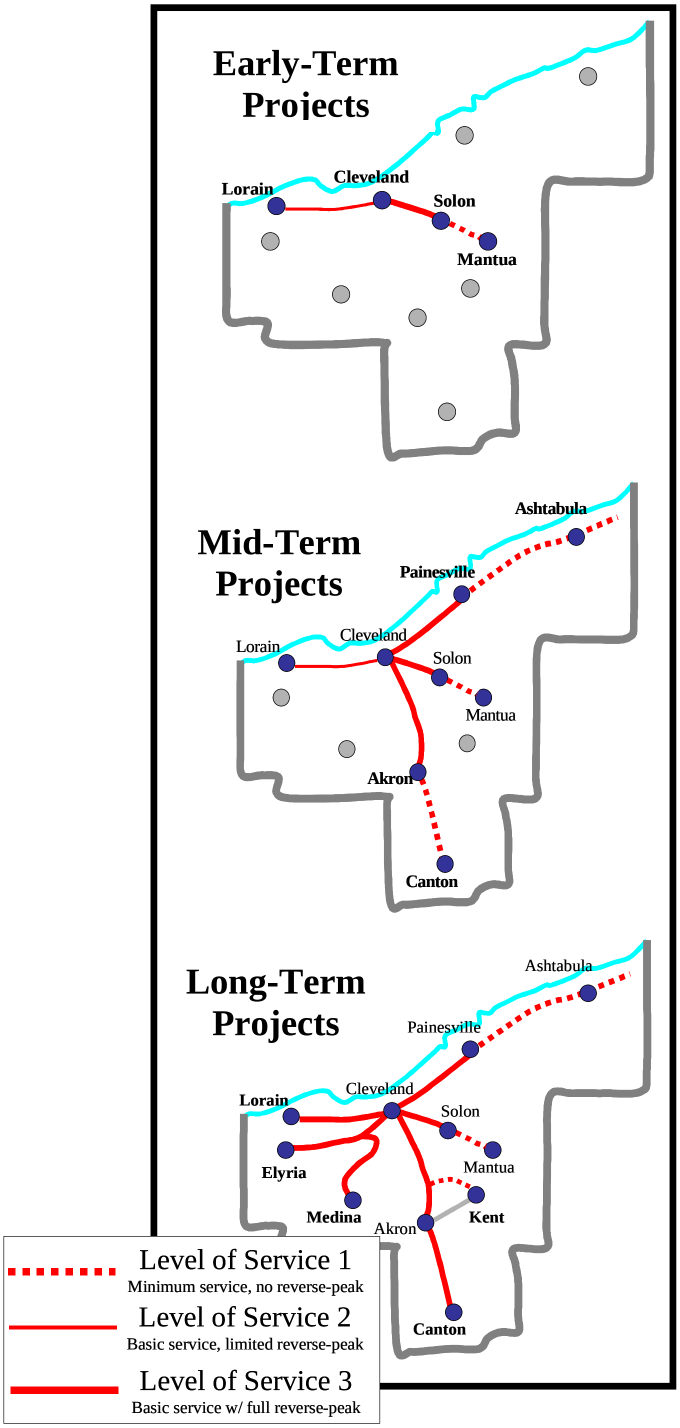
To be feasible and justifiable, investments in commuter rail must be cost-effective, generating ridership and other benefits commensurate with the cost.

The NEORail Study has shown that larger commuter rail networks with multiple branch lines increase the potential for rail to serve trips across or through the city center, better meet the regional development and mobility goals, and achieve economies of scale that enable fixed costs to be spread over a larger ridership base.

The point of diminishing returns can be reached, however, in corridors that compete for the same riders as other parallel corridors and where implementation difficulties or right-of-way constraints considerably raise the incremental capital cost. The financial resources of the region are limited and the cost of commuter rail implementation is high, necessitating a phased approach to implementation.

Therefore, the NEORail Phase II Study has developed the following findings and recommendations:

Phasing Strategy



1. The commuter rail network in Northeast Ohio that best achieves the region's development and mobility goals in a cost-effective manner comprises four routes radiating outward from Cleveland:
   - [1] Lake West corridor to Lorain
   - [7] Lake East corridor to Painesville and Ashtabula County
   - [6] East corridor to Aurora and Mantua
   - [4] South corridor to Akron and Canton via Hudson

2. The CRAC recommends an early project to initiate commuter rail service in the Lake West and Southeast corridors. An MIS will be required to secure federal funding for commuter rail in this corridor. This project offers the best opportunity for early success:
   - Commuter rail service would be provided westward to Lorain and eastward to Aurora and Mantua.
   - It is the most cost-effective of all the combinations of routes and services examined in the study, in terms of riders attracted to the service for the dollars expended to create the service.
   - It should be possible to implement this service in a reasonable amount of time, given that Norfolk Southern (NS) is the only freight railroad materially affected, the proposed plan offers significant capacity and cost-savings benefits to NS to compensate for the use of its right-of-way, and the proposed alignment results in minimal interference of commuter trains with freight operations.
   - It provides early service to both the east and west sides of the region.

3. Extension of the commuter rail network into the South and Lake East corridors should proceed as soon as practicable, so that the benefits of a regional rail network can be realized as soon as possible and have the greatest effect on regional development patterns. Development of one or both of these routes could proceed simultaneously with implementation of the recommended early project, provided local support can be garnered, sufficient funding is made available and agreements can be negotiated with the rail freight right-of-way owners. The implementation process can proceed largely independently in each corridor, since they are physically separate from one another and have distinct geographic and political constituencies.

    - South Corridor (Canton-Akron-Cleveland):
      The final alignment, configuration, operating characteristics and implementation phasing will be determined by the ongoing MIS for the CAC Corridor. NS, CSX and the Wheeling & Lake Erie Railroad all will be involved in discussions and negotiations to initiate commuter rail service in this corridor.

    - Lake East (Cleveland-Painesville-Ashtabula):
      An MIS will be required to secure federal funding for commuter rail in this corridor. CSX Transportation is the right-of-way owner of the entire route, as described in the NEORail II Study. The MIS should address alternative rail routings (i.e., service via University Circle instead of Collinwood) as well as alternative modes in this corridor.

4. Early action should be taken to preserve rights-of-way for potential future additions to the network, and conditions should be monitored for changes that could affect the feasibility, performance and configuration of rail service in additional corridors.

    - West Corridor, Cuyahoga River Crossing and Hopkins Airport:
      Measure the extent to which the Erie-Nickel Plate Connection is able to divert freight traffic away from the lakefront. Monitor the progress of intercity passenger rail initiatives and coordinate planning and engineering efforts with those studies. Participate in long-range master planning for Hopkins International Airport with a view towards assessing the potential for creation of a passenger rail station and multi-modal hub at the air terminal. Work cooperatively with various potential stakeholders to identify the characteristics, costs and implementation timing of a new bridge crossing of the Cuyahoga River at the lakefront. Coordinate efforts with all of the above and seek funding partnerships that could spread the high cost of infrastructure among multiple beneficiaries and potentially advance the timing of investment.

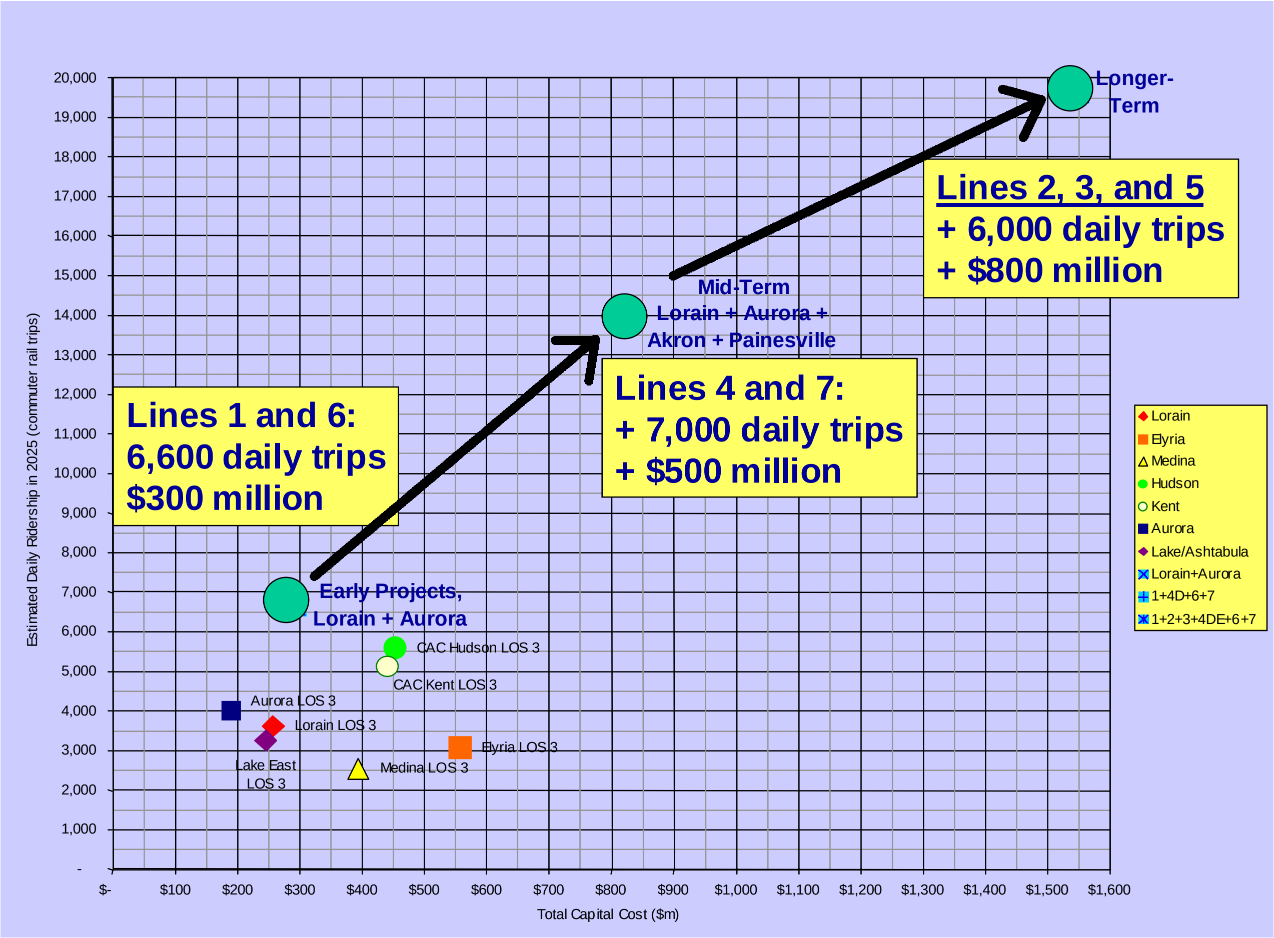
    - Portage County (Streetsboro & Kent) and Medina County (Medina & Brunswick):
      Provide bus connections to the regional rail network in an early phase of development. Monitor the pace and patterns of residential and employment development in these counties for changes from the assumptions made in the NEORail II Study. Evaluate alternative long-term alignments and modes for expanded public transportation service in these counties, including potential extensions of the regional rail network.

The detailed definition of the network configuration and service patterns will be subject to refinement during subsequent planning efforts. Implementation will be able to occur in phases, as demand for service increases and funds become available over time.

As the adjoining graphic shows, the Phase I lines (1 and 6) are the most cost effective, carrying around 6,600 daily trips at a cost of $300 million. Adding lines 4 and 7 in Phase II adds more than 7,000 trips at a cost of around $500 million. Lines 2, 3 and 7 in Phase III would double the cost of the system and would add around 6,000 daily trips.

The CRAC endorsed the tiering and phasing schedule in March, 2001, with some amendments resulting from public comments. Their recommendations were endorsed by the NOACA Board in April. It is possible that subsequent decisions and events, such as changes in the availability of funding or of rail right-of-way, may alter this phasing at some time in the future.

Costs and Benefits of Commuter Rail Routing Combinations



Public Involvement

Nine public meetings were held in February 2001 to obtain public comment on the CRAC's tiering recommendations. Meetings were held in each of the seven NEORail corridors. The meetings reflected community interest in regional commuter rail in Northeastern Ohio, including skepticism about the levels of local support for implementation and for supporting the required investments. Many commenters were interested in learning details of the system's operations. Direct opposition to commuter rail was largely confined to residents whose homes adjoined affected rail rights-of-way. Additional comments questioning whether the potential ridership warranted the large investment were common.

Interviews with more than 50 stakeholders—political and civic leaders from around the region—and nine community meetings were held during the second phase of the study to get public input and assess the level of public support for commuter rail in the region.

Finance and Administration

The financing and governance options considered in the study concentrated on the four-corridor system consisting of the Early-Term (Phase I) and Mid-Term (Phase II) Corridors. The options for administering the operations of the commuter rail system could include

- governance by the State of Ohio through the Ohio Department of Transportation (ODOT) or the Ohio Rail Development Commission (ORDC);
- operation by one of the existing regional transit authorities (RTAs) serving the region, such as Greater Cleveland Regional Transit Authority (GCRTA) or METRO RTA in Summit County;
- creation of a new regional commuter rail authority, or
- an inter-local agreement between the existing local RTAs.

The analysis of these options indicated that there is no compelling technical reason to favor one of these governance options over another. The CRAC has elected not to recommend a specific governance option in this phase of the study.

The feasibility of commuter rail in large part hinges on the availability of funds to pay for building and operating the system. Development and operation of the system would likely require a combination of federal, state and local funding sources. It has been determined that existing levels of funding could not support both the continued operation of existing systems and the development and operation of the proposed commuter rail system.

A variety of governmental grant and loan programs at the federal, state and local levels are available to fund the system. The draft financial plan assumed that 50% of the costs of the system's development could be funded through federal grant programs such as the Federal Transit Administration's New Starts program. The plan assumed that the remaining costs would be split evenly between State of Ohio grant programs and local sources. The local share of the capital costs and the operating subsidy requirements for the Early-Term and Mid-Term systems (Phases I and II) could be met with a funding stream, in year 2000 dollars, of around $30 million per year. The revenue could be generated through several local options that are available. In Northeast Ohio, a primary source of both local capital and operating revenue for public transit is a locally enacted sales and use tax, commonly called a "piggyback" tax on Ohio's 5% sales tax. Local tax options will require voter approval. Local tax increases, however, are not the only option for generating the local share of funding and, at this point, have not been recommended by the CRAC.

Both the financial and governance options should be widely discussed in an open public forum to consider all the issues related to implementation of commuter rail and to reach a regional decision on whether to advance commuter rail to the next planning level.

Conclusion

The primary objective of the Northeast Ohio Commuter Rail Feasibility Study (NEORail), Phases I and II, was to provide the region's decision-makers with information necessary to make an informed decision on initiation of commuter rail service in northeast Ohio. A significant amount of data regarding the cost and operation of commuter rail service in northeast Ohio has been collected, analyzed and presented to the public as well as the region's decision-makers. The final study recommendations represent an objective analysis of the data and outline a logical, phased plan for implementation of commuter rail service should the region decide to proceed. The plan includes reasonable and potential funding options for both capital and operating expenses recognizing that no federal, local or state funds are currently available, authorized or appropriated to cover any development or operating costs. Identification of the entity that would operate the service is a future issue to cover if a regional decision to implement is reached. The study offers several governance options for consideration if that point is reached.

Also, and this cannot be emphasized too strongly, this study has attempted to concentrate on the objective analysis of data and not be influenced by factors which cannot be quantified.   The significant public debate that must take place leading to a regional decision whether or not to pursue implementation of commuter rail will provide ample opportunity for debate of these issues in an open forum.

Finally, the study reflects an analysis of the best data and information available at the time of the study was being conducted. The freight railroad industry is and has been in a major state of flux since the division of Conrail's assets between NS and CSX. The future extent of intercity rail passenger service in the region also cannot be predicted at this time. Conditions are changing constantly and will need to be continually monitored, and the conclusions of the NEORail Study revisited as necessary in light of these changes.

Chapter 1: Project Overview

1.1 Purpose of the NEORail Study

1.2 Organization of the Study

1.3 Scope of the Phase II Study

1.4 Public Involvement

1.5 Relationship to Other Planning Studies and Initiatives

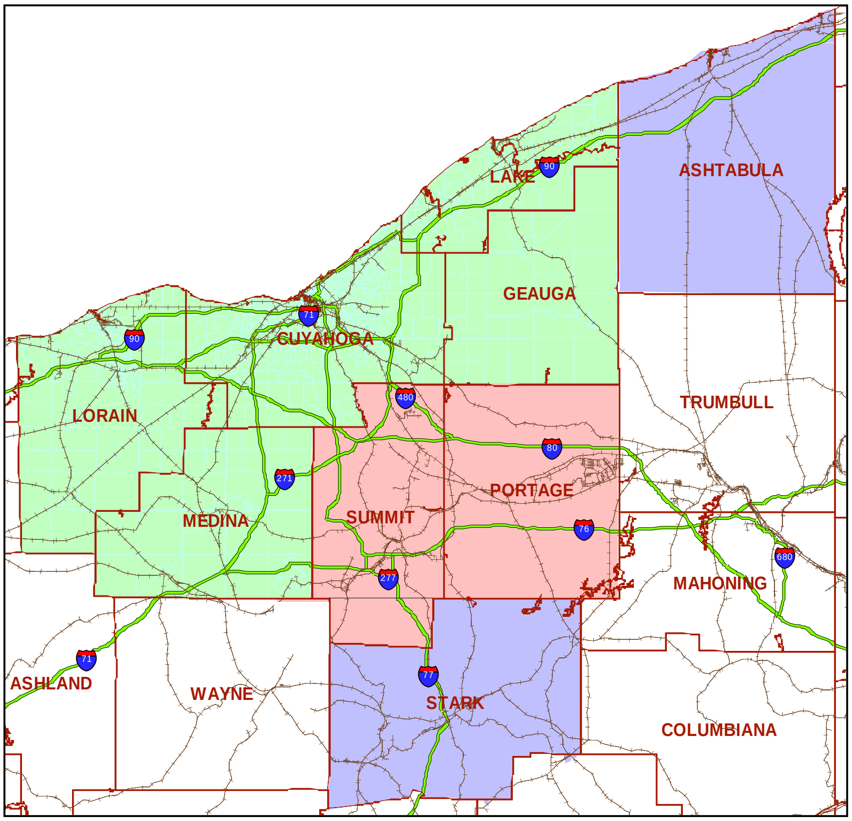
1.6 Next Steps

CHAPTER 1 - PROJECT OVERVIEW

1.1 BACKGROUND AND PURPOSE OF THE NEORAIL STUDY

The Northeast Ohio Commuter Rail Feasibility Study, also called the NEORail Study, was initiated in late 1997 to assess the potential for regional commuter rail service within a nine-county study area. The NEORail study has been sponsored by the Northeast Ohio Areawide Coordinating Agency (NOACA), in partnership with the Akron Metropolitan Area Transportation Study (AMATS) and the Stark County Area Transportation Study (SCATS). The nine counties within the study area are Ashtabula, Cuyahoga, Geauga, Lake, Lorain, Medina, Portage, Stark, and Summit (See Figure 1.1).

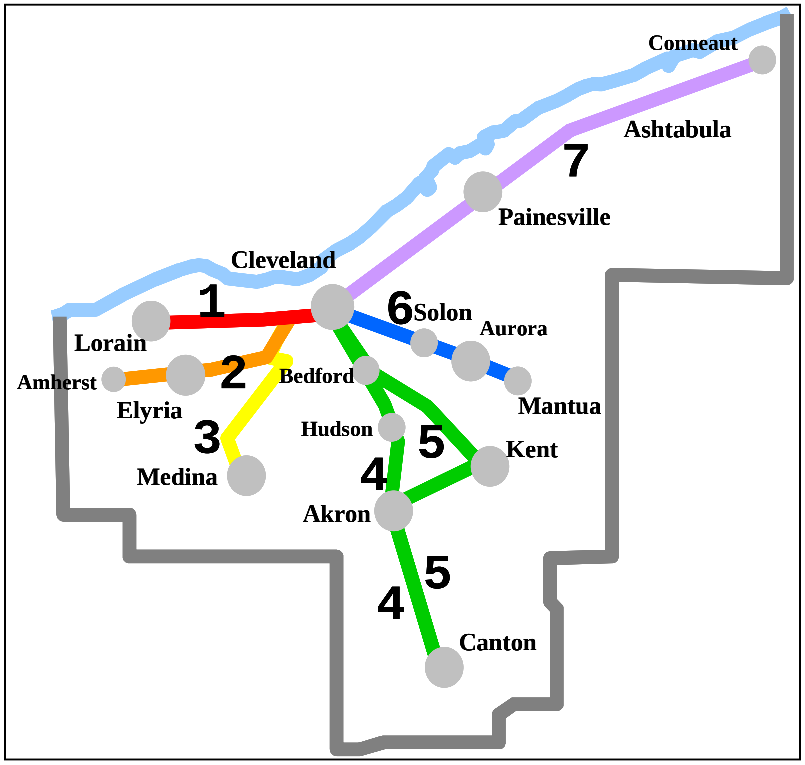
Figure 1.1
NEORail II Study Area



Phase I of the NEORail Study was completed in October 1998. This initial phase evaluated ten broad corridors (and a total of 39 potential alignments) against a set of criteria – ridership potential, cost-effectiveness, rail freight impacts, land use and development impacts, community support, and others. This analysis showed that seven of the ten corridors offered characteristics – in terms of cost, ridership, and other indicators – that were similar to other commuter rail lines in operation across the country. On this basis, the seven corridors were considered to meet a basic test of potential feasibility. These seven corridors, shown in Figure 1.2, below are:

1. Lake West Corridor, Cleveland – Lorain
2. West Corridor, Cleveland – Elyria – Amherst
3. Southwest Corridor, Cleveland – Medina
4. South Corridor, Canton – Akron – Cleveland via Hudson
5. South Corridor, Canton – Akron – Cleveland via Kent
6. East Corridor, Cleveland – Solon – Aurora – Mantua
7. Lake East Corridor, Cleveland – Painesville – Ashtabula – Conneaut

Figure 1.2
Potential Commuter Rail Routes



Following Phase I, the sponsoring agencies agreed to undertake a second phase of NEORail to develop a more detailed understanding of commuter rail's costs and benefits, to identify a possible phasing schedule, and to prepare an implementation strategy. This report summarizes Phase II of the NEORail Study. The NEORail Phase II results will aid regional decision-makers in deciding whether or not a commitment to commuter rail makes sense, and, if so, how best to proceed.

1.2 ORGANIZATION OF THE STUDY

NOACA created a Commuter Rail Advisory Committee (CRAC) to provide technical direction to the NEORail Study. CRAC members were drawn from throughout the study area, and represented both the public and the private sector. CRAC meetings were generally held on a monthly basis throughout Phase I and Phase II. The committee reviewed technical data, discussed a wide range of issues pertaining to commuter rail in Northeast Ohio, evaluated the consultant team’s findings, and provided its recommendations to the MPO Boards. The members of the CRAC are listed in Appendix A, along with a schedule of the meeting dates, agendas, and meeting result summaries.

The consultant team, led by Parsons Brinckerhoff Ohio, Inc. (PB), performed the technical work for Phase II of the study. PB developed potential commuter rail operating plans, projected the likely level of rail ridership in each corridor, estimated each line’s capital and operating costs, evaluated station location options, coordinated with the affected railroads, and explored available finance and governance options. The results of these analyses are summarized in subsequent chapters of this Final Report. Urban Conservation and Design, Inc. managed the stakeholder outreach and public involvement elements of the study.

1.3 SCOPE OF THE PHASE II STUDY

The overall goal of the NEORail Study has been to assess the feasibility and practicality of developing commuter rail service in Northeast Ohio. The study has sought to identify, and quantify where possible, the benefits of commuter rail, and it has compared these benefits with the anticipated costs of implementing and operating the service. The study has identified and described the “best possible” commuter rail plan for the region – where it goes, how it operates, how much it costs, how many people will ride it, and what it can do to advance the region’s mobility and development goals. This information will allow the NEORail Study sponsors, the Boards of the three Metropolitan Planning Organizations (MPOs), to consider and evaluate commuter rail in the context of total transportation investment needs as regional Transportation Plans are updated. The study also has a broader audience. It provides regional policy-makers and decision-makers with the information necessary to participate in an informed discussion on the role of commuter rail in Northeast Ohio and, ultimately, to make the decision whether or not to pursue implementation of commuter rail in the region.

The scope of the Phase II work effort included the following tasks:

- Complete analysis of corridors identified as potentially feasible in Phase I of this Study;
- Prepare estimates of future ridership demand, and identify railroad rolling stock options, potential station locations (taking into account associated land use considerations), least-cost capital investment solutions to major capacity impediments, and other physical, operating and cost characteristics. Address local issues identified in Phase I;
- Address all the issues related to commuter rail start-up in a comprehensive plan. The plan should contain information in sufficient detail to answer complex questions such as:

  - To what extent would a network of multiple commuter rail lines achieve efficiencies and economies of scale, and generate greater regional benefits, compared to the implementation of a single route?
  - Is there a practical limit to the size and extent of a Northeast Ohio commuter rail network, beyond which a point of diminishing economic returns is reached?
  - Can strategic investment in the region's rail network simultaneously enable commuter rail and provide for the reliable operation and future growth of rail freight service – fostering regional economic development?
  - How should implementation of commuter rail be phased? Which route(s) make sense to implement first?
  - Who should own and operate the system?
  - Does the region have the fiscal capacity to fund the capital and ongoing operating costs of a commuter rail system?
  - How do funding limits and other resource constraints affect the timing and phasing of implementation?
- Determine how the implementation of commuter rail service will impact the MPO's adopted Transportation Plans and programs and the goals which guide their development; and
- Conclude Phase II with a recommendation(s) as to whether commuter rail is a viable, beneficial and cost-effective transportation option that should be considered for implementation through inclusion on the regions' Transportation Plans.

1.4 PUBLIC INVOLVEMENT

As part of the public outreach effort for the nine-county NEORail II Study, members of the consulting team met with 50 project stakeholders during the summer and fall of 2000. An informational handout was created for the stakeholders as a briefing on the study and a copy of this handout is included in Appendix B-1. These meetings were held to brief stakeholders on the goals of the second phase of this study, and to seek their reaction to the overall concept of commuter rail. Twenty-seven separate meetings were held with various groups of stakeholders, and the comments received from these meetings were shared with the Commuter Rail Advisory Committee. (Included in Appendix B-2)

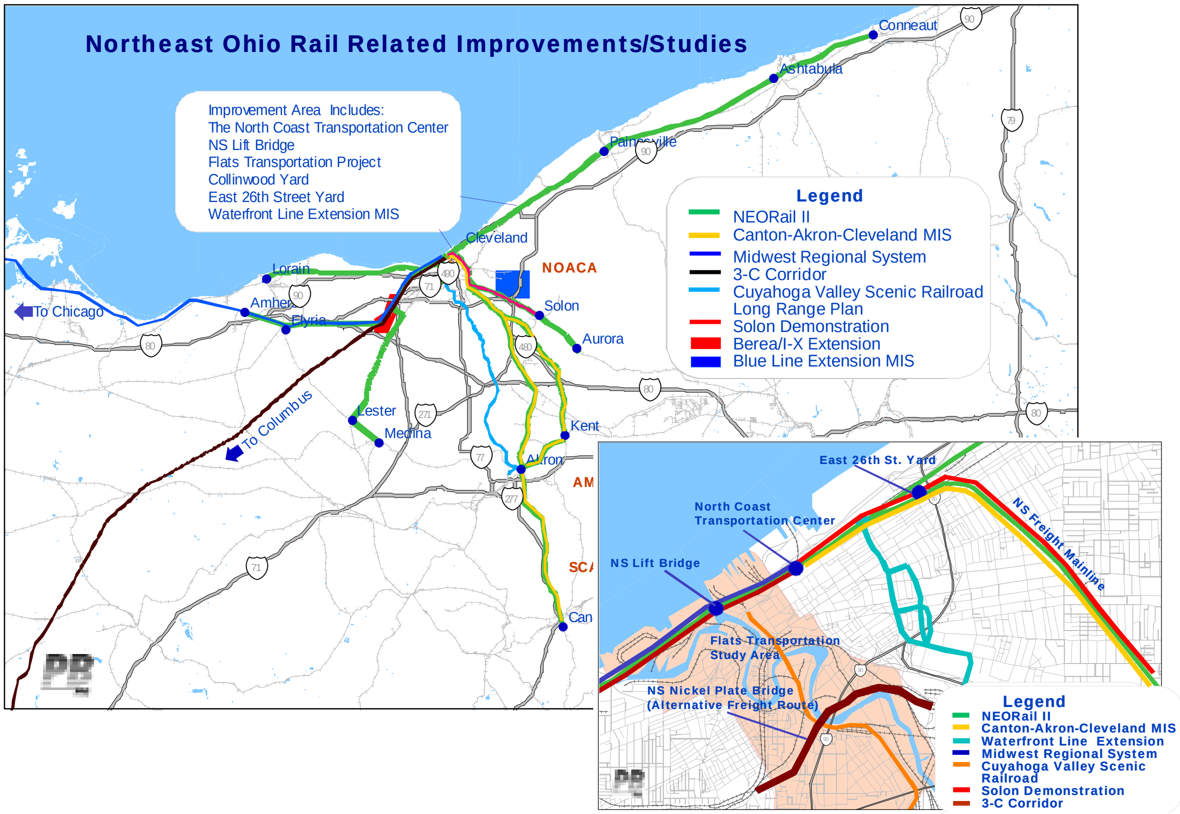
As the study continued, so did the public involvement process. Nine community meetings were held in February 2001. These meetings were designed to evoke public comment concerning the preliminary recommendations for phased implementation of commuter rail service in seven potential corridors. Meetings sites, chosen so that persons from all corridors would have a convenient place to attend, were in Bay Village, Lorain, Medina, Hudson, Canton, Twinsburg, Kent, Aurora and Mentor. At each meeting location a handout specific to the corridor was prepared and distributed. These handouts are contained in Appendix B-3.

During Phase II, a formal newsletter was distributed to the public. This newsletter provided information regarding the status, findings and recommendations of the study, and provided detailed information on the phasing strategy. A copy of the newsletter is included in Appendix B-4. Copies of the questions and answers from the public meetings, which were provided to the CRAC for their consideration, are also included in Appendix B-5.

1.5 RELATIONSHIP TO OTHER PLANNING STUDIES AND INITIATIVES

Commuter rail in Northeast Ohio would affect and be affected by many other transportation and economic development initiatives in the study area. In some cases, commuter rail is competing with other users and uses for scarce railroad capacity and real estate. Commuter rail projects may be mutually exclusive with other projects, or they may result in joint benefits and potential funding partnerships. Figure 1.3 highlights several of the related studies or initiatives that were ongoing at the time of NEORail Phase II. To the extent that information was available from these studies, it was taken into account in the Phase II study. In many cases, the NEORail study had to make assumptions about the ultimate outcome of these studies.

Figure 1.3
Northeast Ohio Transportation and Development Initiatives
(Ongoing in 2000-2001 timeframe)


Northeast Ohio Rail Related Improvements/Studies
Improvement Area Includes:
The North Coast Transportation Center
NS Lift Bridge
Flats Transportation Project
Collinwood Yard
East 26th Street Yard
Waterfront Line Extension MIS
Conneaut
Ashtabula
Painesville
Cleveland
Lorain
Amherst
Elyria
To Chicago
To Columbus
NOACA
Solon
Aurora
Lester
Medina
Kent
Akron
AM
SCA
Canton
Legend
NEORail II
Canton-Akron-Cleveland MIS
Midwest Regional System
3-C Corridor
Cuyahoga Valley Scenic Railroad Long Range Plan
Solon Demonstration
Berea/I-X Extension
Blue Line Extension MIS
East 26th St. Yard
North Coast Transportation Center
NS Lift Bridge
NS Freight Mainline
Flats Transportation Study Area
NS Nickel Plate Bridge (Alternative Freight Route)
Legend
NEORail II
Canton-Akron-Cleveland MIS
Waterfront Line Extension
Midwest Regional System
Cuyahoga Valley Scenic Railroad
Solon Demonstration
3-C Corridor

Foremost among these is the Major Investment Study (MIS) for the Canton-Akron-Cleveland (CAC) Corridor, which is in progress at the time of this report. The CAC MIS is being conducted by Parsons Brinckerhoff (PB) under contract to METRO RTA. The scope of the MIS includes assessing the costs, benefits, and impacts of commuter rail in NEORail corridors 4 and 5, along with other modal alternatives. The NEORail II Study has been closely coordinated with the CAC MIS. Information was shared between the two studies, so as not to duplicate efforts in data gathering or technical analysis. The ridership forecasts, cost estimates, and other interim technical results of the CAC MIS were shared with the NEORail study as they became available. The MIS is the process that will determine whether commuter rail is an appropriate mode to help meet transportation needs (such as relief of traffic congestion) in the CAC corridor and, if so, which alignment and configuration of service is best. The MIS is also a necessary step for qualifying for FTA “New Starts” funding for a major mass transit investment such as that represented by a new commuter rail line or network. One or more MISs will be the next steps in the development of commuter rail in the NEORail corridors other than the CAC corridor, if such further development occurs. However, the NEORail study is better equipped than the MIS to identify and document the regional travel benefits, synergies and economies of scale of a regional commuter rail network serving multiple corridors.

Another key planning initiative is the Cleveland Innerbelt study, which will determine the extent of highway reconfiguration on the east side of downtown Cleveland, and which may offer the opportunity to create, at the same time, at least a portion of the incremental railroad capacity necessary to provide commuter rail service to the east, southeast and south of Cleveland. On the west side of downtown Cleveland, plans for improving access to Cleveland Hopkins International Airport, the Port of Cleveland, the Flats district and the emerging greenway corridors for pedestrians and bicyclists may dovetail with plans for increasing railroad capacity – so that the high cost of infrastructure improvements might be spread among multiple beneficiaries and those benefits realized by a wide cross-section of the region’s people.

In Akron, development plans for the north side of the central business district may determine which of several potential Akron rail station locations makes the most sense for NEORail service, and CSX’s plans for reconfiguration of its Hill Yard may affect the alignment and cost of NEORail track connections into Akron from the north.

The environment in which the existing rail system operates is a dynamic one, as is the climate for development near and along rail lines. The existing conditions on which the NEORail II Study were based will not remain constant for long, and the study’s results and recommendations will need to be kept up-to-date and refined as the future unfolds. Those entities that have stake in regional commuter rail must take care to see that actions and events are avoided that either preclude implementation of commuter rail or make it more expensive. Similarly, opportunities should be sought and explored to improve the effectiveness of commuter rail and lower its high cost of implementation through funding partnerships and cooperation with the railroads.

1.6 NEXT STEPS

The CRAC recommendations included in this final report will need to be considered by the Board of NOACA, the Policy Committee of AMATS, and the Policy Committee of SCATS, which may lead to decisions on the next steps for commuter rail. The NOACA Board and the AMATS and SCATS Policy Committees may decide to support further exploration of commuter rail, or to abandon the proposal altogether. If the former, the Board and Policy Committees may establish a committee or committees to direct these further efforts, as outlined in the CRAC Recommendations, which are described in Chapter 5.

The next step in the consideration of commuter rail might be an Alternatives Analysis or Major Investment Study (MIS) in one or more of the NEORail corridors. Such a planning study is required under Federal law and regulations in order to maintain eligibility for Federal New Starts funding. More importantly, such a study would give local officials a sound technical basis for deciding whether commuter rail – or some other strategy – would be the best answer to each corridor's transportation needs. In an MIS, commuter rail would be compared with other alternatives in terms of the costs, benefits and impacts. This would lead to the selection of a Locally Preferred Alternative that local officials consider to the best solution, and inclusion of the Preferred Alternative in the regional transportation plan of the relevant MPO(s).

As noted above, an MIS is currently underway that covers both Corridors 4 and 5. Appendix C of this report offers some initial ideas for the alternatives that might be considered in the other three Early-Term and Mid-Term corridors.

Chapter 2: Regional Travel Patterns and the Role of Commuter Rail

2.1 **Regional Demographics and Travel**
2.2 **Potential Regional Benefits of Commuter Rail**

CHAPTER 2 – TRAVEL PATTERNS AND THE ROLE OF COMMUTER RAIL

2.1 REGIONAL DEMOGRAPHICS AND TRAVEL

Major economic and demographic trends will affect travel in Northeast Ohio over the coming decades. Some of these trends potentially favor investment in new public transportation services, including commuter rail, while others could make the efficient development of new public transportation services more challenging:

Trends that potentially favor future investment in new regional public transportation:

- An aging population and continued growth of entry-level jobs in the suburban periphery, trends that will continue to support the expansion in public transportation in some form, most likely at levels above what exists today;
- Increasing recognition of the environmental and social consequences of dependency on the private auto;
- Increasing awareness of the effect of transportation convenience and connectivity on the region's economic vitality and ability to achieve economic growth; and
- Increasing scarcity of fossil fuel, with growing uncertainty as to sources and stability of price.

Trends that could make the efficient development of new transit services more challenging:

- Regional population and employment that is growing very slowly but dispersing rapidly, which is difficult to serve with traditional, fixed-route, line haul transit services;
- Downtown Cleveland, while still the region's largest employment concentration, is projected to diminish in its relative importance as an employment center over the next 25 years;
- Suburban development patterns that are scattered, self-contained and of low density; and
- Increasing numbers of suburb-to-suburb and reverse commute trips that are difficult to serve with public transit.

These trends are quantified, and their effects on expected travel patterns and potential transit and commuter rail ridership are described below. Generally, the historical trends show very little growth, but a steady dispersion of both population and employment, the continuation of a process of suburbanization that began more than 50 years ago. Unless steps are taken to reverse these trends, particularly the increasing suburbanization of employment, the region is likely to face increased auto use and a possible decrease in transit effectiveness. These trends, of course, do not take into account the possible impact that one or more commuter rail lines might have on future land use patterns, population distribution and business location decisions.

The NEORail Study was conducted before results of the US Census for year 2000 were available at a disaggregated level. Thus, the population, employment, and demographic information that was analyzed in the study, and the travel demand estimates and commuter rail ridership projections that are documented in this report are based upon 1990 census data, updated over the course of the past decade by the region's Metropolitan Planning Organizations (MPOs). The year 2000 Census will shed new light on the characteristics of regional population, employment, and travel patterns. Future studies will be able to update the technical results of this study, using year 2000 census data.

The analysis of population and employment trends in the region focuses on the NOACA region, which comprises Cuyahoga, Geauga, Lake, Lorain and Medina Counties. Portage and Summit Counties, which lie in the Akron Metropolitan Area Transportation Study (AMATS) MPO region, and Stark County, which lies in the Stark County Area Transportation Study (SCATS) MPO region, are situated in the NEORail South Corridor (primarily served by potential commuter rail Routes 4 and 5), also known as the Canton-Akron-Cleveland corridor. A separate major investment study for the Canton-Akron-Cleveland Corridor has generated considerable base data, which has been incorporated into the work of this study. The other county under consideration in the NEORail study, Ashtabula County, lies outside the regions of any of the MPOs. Thus, the sort of population and employment projections that exist for the MPO areas have not been developed for that county. However, the demographic maps provided in Appendix C provides population density and other data based on 1990 Census data and estimated projections to year 2002 for Ashtabula County and other areas that lie outside the MPO jurisdictions.

2.1.1 Population

Trends projected by the three regional MPOs generally show relatively stable total population in the region, with an out-migration of population from Cleveland and the inner suburbs of Cuyahoga County and continued dispersion of population throughout the other five counties. These projections essentially assume continuation of the historical trends and do not directly account for the possible effects of major investments in transportation infrastructure (either highway or transit), or the lack thereof.

Table 2.1 shows the population in 1990 and a population projection for 2025 for eight of the nine counties analyzed in the second phase of the NEORail study (Ashtabula County, which is not part of an MPO region, has no population or employment projections comparable with those prepared by NOACA, AMATS and SCATS for the counties in their MPO regions). The eight county population is expected to increase by more than 132,000 persons over this 35-year period, an increase over the period of about 4.2% and a rate of annual increase of less than 0.02%. However, this small change in population, effectively a projection of no regional growth over a 35-year period, masks anticipated migration within the region—continued dispersion of population from Cleveland and Cuyahoga County to the surrounding counties. As the table shows, Cuyahoga County is projected to lose nearly 115,000 persons over the 35year period, while all of the surrounding counties in the region are posting population increases. As a result, Cuyahoga County's proportion of the region's population drops significantly. Three of the least developed counties in the region—Medina, Geauga and

Portage—are those projected to have the highest rates of population growth over the 35-year period. Given the low-density development pattern characteristic of current, auto-oriented residential development, this dispersion of the population presents the region with conditions that makes operation of public transportation—whether bus or rail—more challenging.

Another trend likely to have a significant impact on transportation in the region is the shift in population growth in the Cleveland area from east side to west side suburbs. For many years, outward migration in the Cleveland area has been more pronounced on the east side than on the west side, but NOACA projections indicate that population growth will shift significantly to the west side suburbs over the next 25 years. Lorain and Medina Counties are projected to grow by 118,000 people by 2025, while Lake and Geauga are projected to grow by only 29,000. Almost 85 percent of the residential growth in the NOACA region, therefore, is projected to occur to the west and southwest of Cleveland. Thus, the center of gravity of population in the region is forecast to move westward.

Table 2.1
Change in Regional Population by County, 1990 to 2025

	1990		2000		2025		Change 1990-2025	
County	**Population**	**% of Total***	**Population**	**% of Total***	**Population**	**% of Total***	**Population**	**% Change**
Ashtabula	99,821		102,728					
Cuyahoga	1,412,140	45.2%	1,393,978	43.3%	1,297,427	39.8%	-114,713	-8.1%
Geauga	81,129	2.6%	90,895	2.8%	102,155	3.1%	21,026	25.9%
Lake	215,499	6.9%	227,511	7.1%	223,741	6.9%	8,242	3.8%
Lorain	271,126	8.7%	284,664	8.8%	319,143	9.8%	48,017	17.7%
Medina	122,354	3.9%	151,095	4.7%	185,320	5.7%	62,966	51.5%
Portage	142,585	4.6%	152,061	4.7%	169,167	5.2%	26,582	18.6%
Stark	367,585	11.8%	378,098	11.7%	385,941	11.8%	18,356	5.0%
Summit	514,990	16.5%	542,899	16.9%	576,826	17.7%	61,836	12.0%
Total	3,227,229		3,323,929					
Excluding Ashtabula	6,454,458		6,647,858		3,259,720		132,312	4.1%

Sources: US Bureau of Census; NOACA, AMATS, SCATS
*Ashtabula County Excluded from Calculation

2.1.2 Employment

The projected loss of more than 100,000 jobs in Cuyahoga County over the 35-year period is even more pronounced than its loss of population, particularly compared to the large job growth projected for the region as a whole. While Cuyahoga County will remain the region's greatest concentration of employment, the county's proportion of the NOACA region's total employment will decline dramatically. The proportion of the region's jobs located in the Cleveland central business district also is projected to decline, as is the absolute number of jobs. These projected losses are more than made up by anticipated employment gains in surrounding counties, as Table 2.2 shows. Two less-developed counties, Geauga and Medina, will gain the most proportionally, with employment more than doubling in Geauga and nearly doubling in Medina. Lake County is projected to gain the most, in raw numbers, with more than 66,000 additional jobs in that county over the 35-year period. Continued employment dispersion could result in fewer dense employment nodes that are attractive as public transit destinations. As in the case of population, these projections do not take into account the impact that one or more commuter rail lines, which could be in operation by 2025, might have on the location decisions of employers, who might be influenced to remain or relocate in downtown Cleveland (the primary focus of the regional rail network) or congregate around commuter rail stations to take advantage of reverse-commute opportunities.

The population growth west of the Cuyahoga River is not matched by employment growth, which is projected to be far greater in the eastern suburban counties than in the west. Employment in Lorain and Medina Counties is projected to grow by only 48,000 by 2025, while Lake and Geauga Counties are projected to grow in employment by more than 101,000 jobs. Thus, the center of gravity of employment in the region is forecast to move *east*ward. The projected spatial disconnect between population and employment growth, coupled with the dispersion of employment and population over a larger area, is likely to lead to a pronounced cross-regional daily commuting movement. This dispersed travel market may prove to be a difficult one for public transit to serve conveniently.

Table 2.2
Change in NOACA Region Employment by County, 1990 to 2025

	1990		2025		Change 1990-2025	
County	**Employment**	**% of Total***	**Employment**	**% of Total***	**Employment**	**% Change**
Ashtabula	40,782					
Cuyahoga	903,465	55.3%	803,121	44.8%	-100,344	-11.1%
Geauga	28,390	1.7%	63,332	3.5%	34,942	123.1%
Lake	103,425	6.3%	169,609	9,5%	66,184	64.0%
Lorain	118,065	7.2%	124,816	7.0%	6,751	5.7%
Medina	47,164	2.9%	89,174	5.0%	42,010	89.1%
Portage	43,760	2.7%	60,997	3.4%	17,237	39.4%
Stark	162,527	9.9%	194,760	10.9%	32,233	19.8%
Summit	227,193	13.9%	285,305	15.9%	58,112	25.6%
Total	1,674,771					
Excluding Ashtabula	1,633,989		1,791,114		157,125	9.6%

Sources: US Bureau of Census; NOACA, AMATS, SCATS
*Ashtabula County Excluded from Calculation

Comparison of 1990 Census Data with year 2002 projections of population and employment in the region, as documented and shown on maps in Appendix C to this report, confirm the outward migration of people and jobs from the center cities and inner suburbs and the shifts in income distribution that are occurring in the region. Population density in the inner-areas of the Cuyahoga County is falling, while it is rising in outer suburban and formerly rural areas. However, except for a few scattered block groups, vehicle ownership is generally rising—particularly in the lower income, inner-city neighborhoods that form the core of transit ridership for GCRTA and other local bus services.

2.1.3 Regional Travel Patterns

The population and employment shifts contained in the region's best estimates produce the following fundamental shifts in regional travel by 2025:

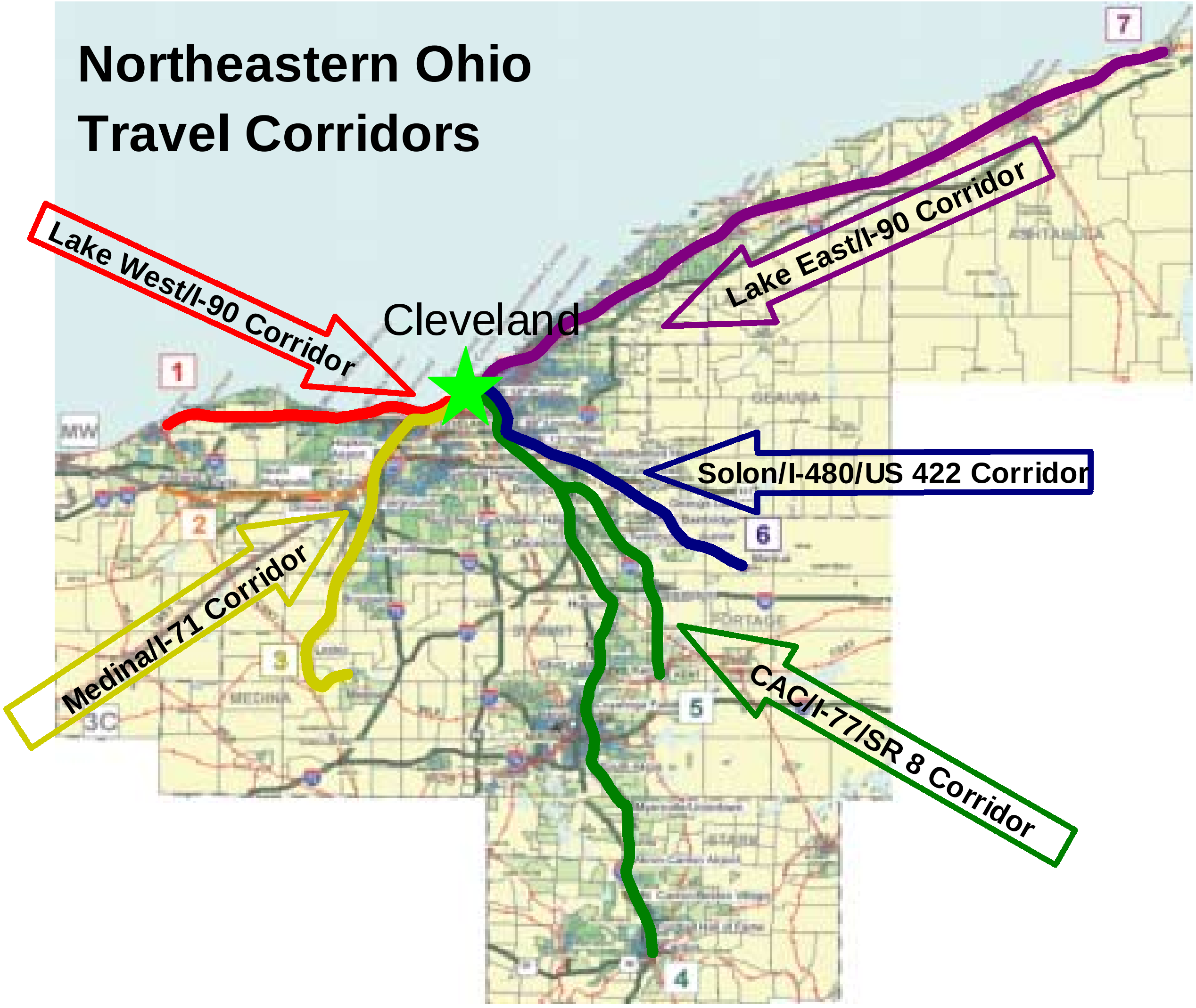
- Slight reductions in trip-making to downtown Cleveland (the focus of the commuter rail network) from most suburban counties;
- Major reduction in trip-making to downtown Cleveland from Lake County; and
- Significant increase in intra-county trips, within the suburban counties.

These trends, in combination with the relative decentralization of employment to locations outside traditional, dense employment areas, are not positive trends for public transit generally, or for commuter rail specifically. If these trends continue, public transit, including commuter rail, will have a more difficult time providing a convenient transportation alternative to automobile travel for work trips and other trips in the region. Such development diffuses the concentration of employment on which public transit depends, making traditional line-haul public transit increasingly inefficient and unattractive to travelers. However, these estimates are essentially projections of past trends, which have seen the increase in auto dependency and the operation of a fragmented, primarily bus-based regional public transit network. Implementation of a commuter rail network has the potential to change development patterns and the pattern of population and job dispersal. However, the analysis of potential commuter rail ridership on the seven NEORail routes, as presented in Chapter 4 of this report, was based upon year 2025 travel demand projections obtained from the regional planning agencies, which were based largely on extrapolation of past trends. Therefore, the ridership projections can be considered conservatively low, since any land use and residential or employment location effects generated by the existence of the rail system are not accounted for and will tend to increase the actual use of the rail system.

Traffic congestion and other transportation problems are less severe in northeastern Ohio than in many larger and faster-growing regions of the US. However, localized congestion, on the highways approaching downtown Cleveland and in many suburban commercial areas, can be severe for short periods during peak travel periods. Automobile travel, as measured in terms of vehicle miles traveled (VMT) is expected to continue to grow in spite of the relative lack of growth in employment and population in the region, and regional congestion, as measured in terms of highway level of service (LOS) and delay, is expected to continue to grow. Safety, environmental concerns, increasing transportation options, and using transportation improvements to spur economic development are other transportation-related issues facing northeastern Ohio as it enters the new century.

Figure 2.1 shows the commuter rail corridors studied in NEORail II overlaid on a map of the major highways of northeastern Ohio. The large arrows depict the general transportation corridors that are served by each of the NEORail II routes. Highway trips generated in each of these travel corridors, especially those oriented to downtown Cleveland, would be affected by, and potentially served by, commuter rail service or other transportation improvements in the corridor. The viability of commuter rail as a practical transportation mode in northeastern Ohio will depend, in large measure, on the potential for commuter rail to address transportation problems and meet other needs in each of those particular corridors, as well as in the region as a whole.

Figure 2.1
Transportation Corridors in Northeastern Ohio Corresponding to NEORail II Corridors

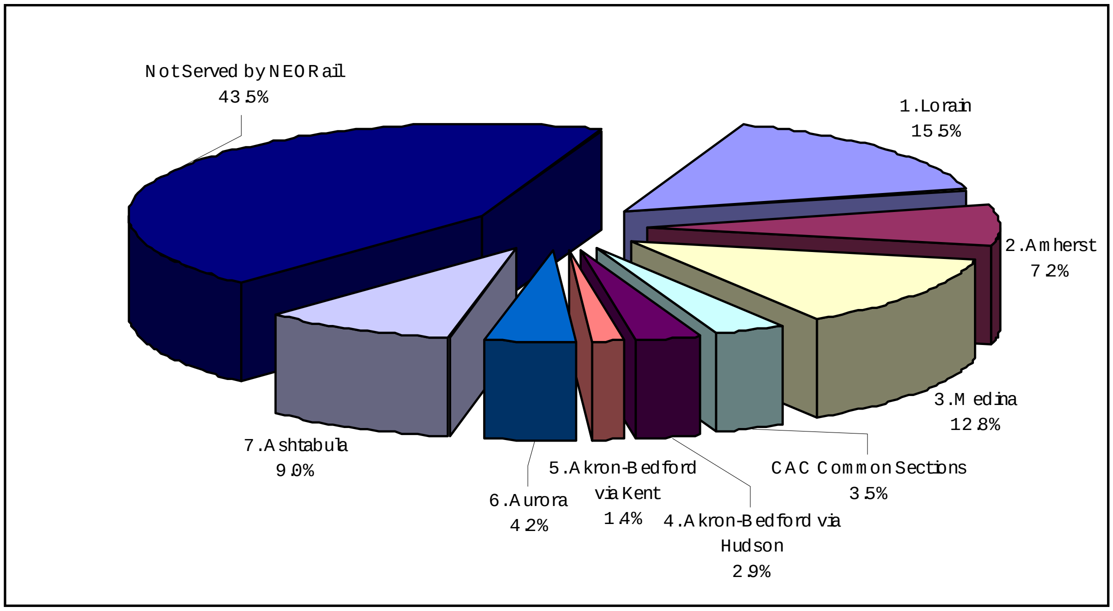


Projected year 2025 county-to-county work trips, including trips to the Cleveland, Akron and Canton central business districts, also show the projected decline in the magnitude of work trips to the traditional downtowns, relative to trips within and between the suburban counties. More detailed matrices of projected work trips and other trips among origin and destination districts within the 9-county study area are contained in Appendix G.

An alternative scenario has been developed and discussed by NOACA, which assumes that Cleveland retains a higher share of regional employment. Alternative scenarios, including this one, were not analyzed in the NEORail study. Scenarios that assume a higher proportion of employment and population locating in proximity to potential commuter rail lines (especially the large central business districts and town centers) and/or longer average work trip lengths (i.e., a higher proportion of downtown work trips originating from outlying suburbs or areas not historically generating a large number of such trips) would tend to generate higher projected commuter rail ridership levels than the scenario which is described below and which formed the basis for NEORail Phase II.

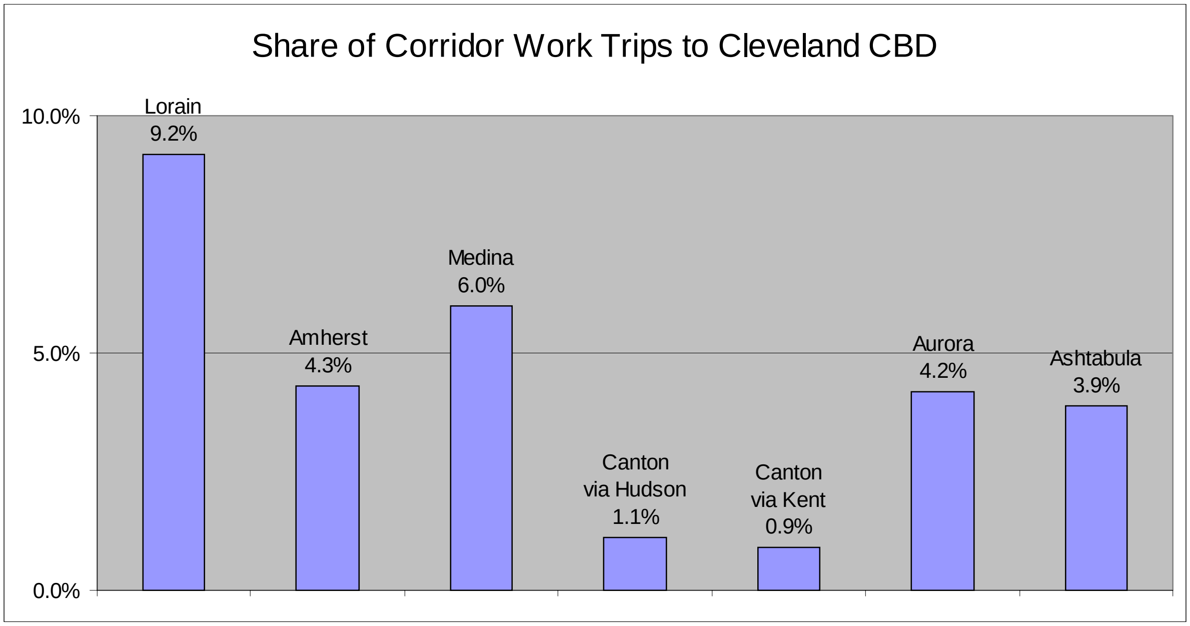
Figure 2.2 shows the relative proportion of the Cleveland CBD-bound trips served by the districts surrounding each of the NEORail commuter rail corridors. Approximately 60% of the estimated 110,000 daily work trips bound for downtown Cleveland in 2025 would be served by one of the seven NEORail corridors. For the purpose of this analysis, those commuters who live within 15 minutes drive time of a station—which translates to 5-10 miles, depending on conditions—are considered to be served by the proposed commuter rail lines. Most of the remaining downtown-bound trips originate in the City of Cleveland or in the nearby eastern and southern suburbs such as East Cleveland, Cleveland Heights, Shaker Heights, Parma, Brooklyn and other nearby suburbs. Most of these areas are well served by existing GCRTA bus and rapid transit service or by the proposed Euclid Corridor busway project, and are too near to the city center to be appropriately served by commuter rail.

Figure 2.2
Proportion of Total Work Trips Bound for Cleveland CBD, by Corridor of Origin (including NEORail Corridors, year 2025)



SOURCE: MPO Travel Demand Model Results; Parsons Brinckerhoff

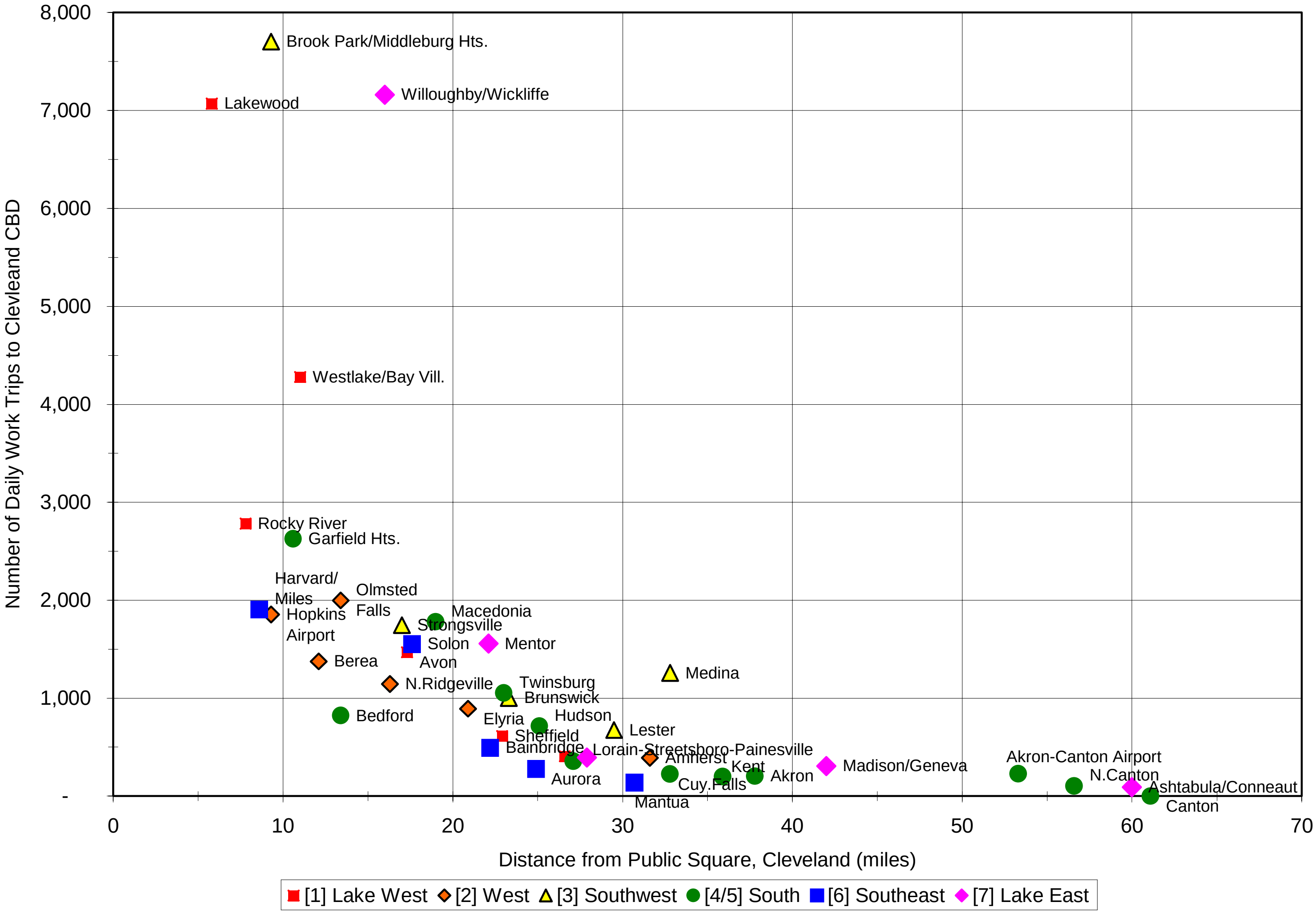
Figure 2.3
Proportion of Total Work Trips Originating in Various Origin Corridors Going to the Cleveland CBD (year 2025)



On the other hand, Figure 2.3 indicates that only a small percentage of workers residing in each the seven NEORail corridors are projected to commute to jobs in downtown Cleveland in the year 2025 – in all cases less than ten percent. Origin districts within the Lake East (Lorain) corridor have the largest percentage of trips bound for downtown Cleveland at around 9%; most of the other corridors will generate far fewer downtown-bound work trips. This indicates that, for people who live in the suburbs, downtown Cleveland competes for work trips with a number of other strong employment destinations within the region.

Work trip patterns in the Cleveland area tend to be relatively short, with a high majority under 20 miles. Figure 2.4 shows how the number of commuters to downtown Cleveland tends to decline as distance from the Cleveland business district increases. Almost all of the suburban districts in the NEORail corridors that are more than 20 miles from the Cleveland CBD generate fewer than 1,000 total work trips to downtown Cleveland.

Figure 2.4
Number of Daily Work Trips to Cleveland CBD from Each NeoRail Origin District



(as a function of distance from the Cleveland CBD)

Consequently, the market in which commuter rail is most competitive – namely, work trips to the central business district over relatively long distances (e.g., greater than 20 miles) – is small relative to the universe of total travel within the study area.

The following series of tables show the number of work trips produced by many of the communities along each of the potential rail corridors in the region; the share of the total work trips produced in the district that are bound to the Cleveland CBD, and the share of all daily work trips bound for the Cleveland CBD that are produced in the district. These estimates provide a guide as to the strength of the work trip pattern bound for downtown Cleveland.

Since the largest portion of commuter rail trips is usually made up of work trips, this also provides an indication to the strength of the markets for commuter rail services.

The prevailing theme is that only a relatively small percentage of work trips from the suburbs that comprise the NEORail service area are actually destined for the Cleveland CBD.

Table 2.3 (below) shows clearly, for the Lake West Corridor, the pattern of diminishing trip-making to Cleveland as distance increases. In Lakewood, one of the nearest suburbs to downtown Cleveland, nearly 20% of work trips are bound for downtown Cleveland; however, Lorain, which is more than 30 miles from downtown Cleveland and is itself a significant employment center, sends fewer than 2% of its work trips to downtown Cleveland.

Table 2.3
Estimated Cleveland CBD Share of Corridor 1(Lorain) Work Trips, 2025

District	Total Work Trips from this District	Share of Work Trips from this district to Cleveland CBD	Share of Work Trips from this district to Cleveland CBD
Lorain	28,986	1.4%	406
Sheffield	24,486	2.5%	612
Avon	24,091	6.1%	1,470
Westlake/Bay Village	46,494	9.2%	4,277
Rocky River	22,449	12.4%	2,784
Lakewood	36,073	19.6%	7,070
Total Corridor	180,579	9.2% avg.	16,619

SOURCE: NOACA Travel Demand Model; Parsons Brinckerhoff

Table 2.4
Estimated Cleveland CBD Share of Corridor 2 (Elyria) Work Trips, 2025

District	Total Work Trips from this District	Share of Work Trips from this district to Cleveland CBD	Share of Work Trips from this district to Cleveland CBD
Amherst	21,678	1.8%	390
Elyria	49,530	1.8%	892
North Ridgeville	26,599	4.3%	1,144
Olmsted Falls	33,880	5.9%	1,999
Berea	22,938	6.0%	1,376
Airport/Brook Park	21,814	8.5%	1,854
Total Corridor	176,439	4.3% avg.	7,655

SOURCE: NOACA Travel Demand Model; Parsons Brinckerhoff

Comparing the results for Corridors 1 and 2 in Tables 2.3 and 2.4 show that while the two corridors contain roughly the same number of workers, the share of work trips in the corridor bound for downtown Cleveland from the Lorain corridor is more than double that of the Elyria Amherst Corridor. This is partly due to the character of the suburbs that the two corridors serve. Lakewood, Rocky River, Bay Village and Avon are older suburbs with large white-collar populations; Brook Park and Berea are post-war suburbs with largely blue-collar populations. Lake Erie, as a recreational amenity, also is probably a factor in attracting more affluent downtown workers to the Lorain corridor. However, the relative ease with which commuters in the Lorain corridor can use I-90 and SR 2 for their worktrip to downtown Cleveland, compared to the more circuitous worktrip to Cleveland required of many if the residents of the Elyria corridor, may also be a factor in this location decision.

As Table 2.5 shows, Medina County has more work trips oriented to downtown Cleveland than does the Elyria corridor, but less than the Lorain corridor. This is probably due both to differences between the two corridors in terms of character, as well as the more direct highway connections to downtown Cleveland provided by both I-90 (serving the Lorain Corridor) and I-71 (serving the Medina Corridor). A less direct highway route (I-480 to I-71) serves the Elyria corridor.

Tables 2.6 and 2.7 show the same data for the stations on corridors 4 and 5, the Canton-Akron-Cleveland corridors (3 CBD's). The impact on worktrip orientation is complicated by the large number of competing workplace destinations in the corridors. This is also a factor in some of the other corridors, including the Lorain and the Aurora corridors (which have smaller but significant workplace destinations at the opposite end of the line from Cleveland), but it is a much more significant factor in the travel patterns in this corridor. Corridors 4 and 5 contain northeastern Ohio's three largest workplace concentrations outside of Cleveland (the I-271/US

422/I-480 area, downtown Akron, and the I-77/Rockside Road area) as well as many other competing workplaces. As a result of these competing workplace destinations and the extreme distance of many of the communities in the corridor from downtown Cleveland (downtown Canton is more than 60 miles from downtown Cleveland, more than 2 hours away during rush-hour traffic), the percentage of workplace trips to Cleveland from many of these destinations is very small. However, because of the many competing workplace destinations, including downtown Akron, that would also be served by the commuter rail service, trips oriented to Cleveland are not as good a measure of the corridor's potential as a commuter rail market than it is in the other corridors.

Indirectness and congestion on the trip to downtown Cleveland, and the many competing workplace destinations available to travelers in Corridor 6, Aurora/Mantua to Cleveland (including I-271/Chagrin Highlands, I-77 Rockside, and downtown Akron) make the proportion of trips to downtown Cleveland in this corridor much lower than the area's affluent character and demographics might indicate (see Table 2.8). However, the traffic congestion and indirectness of the trip to downtown Cleveland might make transit options more acceptable to travelers in this corridor than in others.

Table 2.9 indicates the proportion of work trips in the Ashtabula corridor traveling to Cleveland. As in corridors 4 and 5, distant areas produce few trips to Cleveland, and Lake County's growing strength as an employment center also reduces work travel to Cleveland. The potential in the corridor is greater than indicated by the volume of trips into Cleveland, because the corridor includes many other significant employment destinations, such as Painesville, Mentor and Willoughby.

Table 2.5
Estimated Cleveland CBD Share of Corridor 3 (Medina) Work Trips, 2025

District	Total Work Trips from this District	Share of Work Trips from this district to Cleveland CBD	Share of Work Trips from this district to Cleveland CBD
Medina	54,635	2.3%	1,257
Lester	12,726	5.3%	674
Brunswick	30,357	3.3%	1,002
Strongsville	36,357	4.8%	1,745
Middleburg Hts./Berea	22,938	6.0%	1,376
Brook Park/Parma	73,363	10.5%	7,703
Total Corridor	230,376	6.0% avg.	13,757

SOURCE: NOACA Travel Demand Model; Parsons Brinckerhoff

Table 2.6
Estimated Cleveland CBD Share of Corridor 4 Work Trips
(Canton via Hudson), 2025

District	Total Work Trips from this District	Share of Work Trips from this district to Cleveland CBD	Share of Work Trips from this district to Cleveland CBD
Canton	48,115	0.0%	-
Belden Village	52,075	0.2%	104
Akron-Canton Airport	32,467	0.7%	227
South Akron	51,242	0.0%	-
Akron	202,728	0.1%	203
Cuyahoga Falls	56,668	0.4%	227
Hudson	44,801	1.6%	717
Macedonia	63,551	2.8%	1,779
Bedford	16,096	5.1%	821
Garfield Heights	27,345	9.6%	2,625
Total Corridor	663,244	1.1% avg.	6,703

SOURCE: NOACA Travel Demand Model; Parsons Brinckerhoff

Table 2.7
Estimated Cleveland CBD Share of Corridor 5 Work Trips
(Canton via Kent), 2025

District	Total Work Trips from this District	Share of Work Trips from this district to Cleveland CBD	Share of Work Trips from this district to Cleveland CBD
Canton	48,115	0.0%	-
Belden Village	52,075	0.2%	104
Akron-Canton Airport	32,467	0.7%	227
South Akron	51,242	0.0%	-
Akron	202,728	0.1%	203
Tallmadge	16,140	0.1%	16
Kent	98,949	0.2%	198
Streetsboro	27,419	1.3%	356
Twinsburg	47,796	2.2%	1,052
Bedford	16,096	5.1%	821
Garfield Heights	27,345	9.6%	2,625
Total Corridor	620,372	0.9% avg.	5,602

SOURCE: NOACA Travel Demand Model; Parsons Brinckerhoff

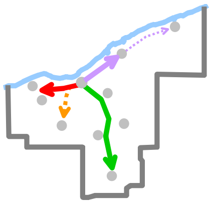


Table 2.8
Estimated Cleveland CBD Share of Corridor 6 (Aurora) Work Trips, 2025

District	Total Work Trips from this District	Share of Work Trips from this district to Cleveland CBD	Share of Work Trips from this district to Cleveland CBD
Mantua	6,589	2.1%	138
Aurora	7,929	3.5%	278
Seaworld	16,453	3.0%	494
Solon Harper Road North Randall	41,947	3.7%	1,552
E. 131st Street E.88th/Union E.55th/Euclid	31,217	6.1%	1,904
Total Corridor	104,135	4.2% avg.	4,366

SOURCE: NOACA Travel Demand Model; Parsons Brinckerhoff

Table 2.9
Estimated Cleveland CBD Share of Corridor 7 (Ashtabula) Work Trips, 2025

District	Total Work Trips from this District	Share of Work Trips from this district to Cleveland CBD	Share of Work Trips from this district to Cleveland CBD
Conneaut Ashtabula West Ashtabula	45,325	0.2%	91
Geneva Madison	25,493	1.2%	306
Painesville West Painesville	32,911	1.2%	395
Mentor	57,654	2.7%	1,557
Willoughby Wickliffe/Willowick	85,244	8.4%	7,160
Euclid	*[Data unavailable]*		
East Cleveland			
Total Corridor	246,627	3.9% avg.	9,509

SOURCE: NOACA Travel Demand Model; Parsons Brinckerhoff

2.2 POTENTIAL REGIONAL BENEFITS OF COMMUTER RAIL

Commuter rail can potentially provide traditional transportation benefits; such as relieving traffic congestion in northern Ohio travel corridors and providing time and cost savings to residents and businesses. But its positive impacts may go far beyond congestion relief and, indeed, beyond direct transportation benefits. With the support of effective public policy actions, a commuter rail network could change the character of the region, tying Cleveland and the other older urban centers of the area and re-concentrating the focus of the region's transportation system on them. Travel and development patterns could change to account for the added transportation capacity provided by the rail service, and connections that were previously difficult could be facilitated, offering new employment and entertainment opportunities to many of the region's residents.

NOACA's *Framework for Action 2025* describes ten regional goals for the northeastern Ohio area for the next 25 years. Seven of these goals, listed in Figure 2.4, generally support a more compact regional development pattern, with fewer environmental impacts and less need for additional transportation investments. The goals also underscore the continuing need for economic development if the northeastern Ohio region is to keep pace with the rest of the country in terms of attractiveness to business and overall prosperity.

Figure 2.4
NOACA Regional Goals

1. Promote Concentrated Development
2. Provide Transportation Choices
3. Support Urban Core Areas
4. Expand Access to Jobs
5. Enhance the Environment
6. Use Existing Infrastructure
7. Leverage Federal Financial Support

AMATS 1999 *Long Range Transportation Needs and Year 2020 Regional Transportation Plan* lists the following goals. Many of these goals parallel those in the NOACA plan:

Figure 2.5
AMATS Transportation Plan Goals

1. The transportation system should reflect and support the values and planning objectives of area communities and neighborhoods
2. The transportation system should encourage desirable settlement patterns.
3. The transportation system should be safe.
4. The transportation system should minimize adverse environmental impacts.
5. The transportation system should provide adequate mobility for all persons.
6. The transportation system should be economically sound.
7. The transportation system should provide for efficient travel.
8. The transportation system should function in a fully integrated manner.
9. The existing transportation system should be preserved, maintained and enhanced.

SCATS' *Year 2020 Transportation Plan for Stark County, Ohio* has the following five goals, some of which also parallel those of the other two MPOs.

Figure 2.6
SCATS Transportation Plan Goals

1. To provide an efficient, safe and economically sound transportation system
2. To provide a multimodal system which includes various modal options, such as bikeways, mass transit, rail and air facilities.
3. To provide a transportation system that is sensitive to social, economic and environmental effects.
4. To provide a transportation system which will reflect and support the values and planning objectives of area communities and neighborhoods.
5. To coordinate the development of transportation facilities and land use.

Development of a commuter rail network would support all of these goals to some extent, but would provide the clearest benefits in addressing four of the goals. These four goals are expressed in the words of the NOACA plan, but are also found in the goals of the other MPOs:

- Promote concentrated development
- Provide transportation choices
- Support urban core areas
- Expand access to jobs

Commuter rail infrastructure, including stations, represents a large fixed investment in the communities that are served by commuter rail. These investments indicate a long-term commitment to transit service that is perceived by developers, residents and employers as permanent, or at least very difficult to withdraw once they are in place. The following sections discuss the role of commuter rail in supporting each of these goals.

2.2.1 Promote Concentrated Development

Economic studies as well as anecdotal evidence confirm that commuter rail services create development opportunities around stations that benefit businesses and residents in the communities they serve. Studies have indicated that the value of land and properties in the vicinity of commuter rail stations is significantly higher than in similar areas in the same region that are not served by commuter rail, and that property values increase significantly when commuter rail service is introduced to a community. (A synopsis of these studies is provided in Appendix D). When supported by complementary local land use policies, these higher values can translate into higher development densities for new development, which results in a pattern of more compact development in the areas served by the commuter rail service. Similarly, commuter rail service can be a catalyst for the revitalization of historic town centers and residential neighborhoods in older communities. Commuter rail cannot, by itself, create a more compact form of regional development. But it can, in combination with suitable supporting policies, provide a basis for guiding regional land use policies toward concentration rather than dispersion by providing an alternate transportation spine to complement that provided by the interstate highways serving the region.

In order for municipalities and the region as a whole to benefit from compact development, land use planning and zoning might be updated to accommodate higher density and mixed-use development in the vicinity of the stations, and to restrict some types of development to station areas. Current zoning, even in relatively compact older cities, often forbids development in a dense, urban pattern, requiring building setbacks, minimum parking requirements and other elements that ensure that any new development will be low density and of a different character from much of the older development in the city. While parking and other elements of modern life must be accommodated, older cities, using commuter rail as an anchor, could use their density, together with their older architecture and other elements, to create places that are qualitatively different from typical suburbs that might appeal to businesses and residents looking for an alternative to the suburban lifestyle.

As part of NEORail II, a brochure was developed to show how local governments might plan the development of commuter rail station areas and promote more concentrated development. The brochure is called "Land Use Guidelines for Transit Supportive Development: Planning for Commuter Rail Station Area Development in Northern Ohio Communities" (June 2001) and is provided in Appendix E.

2.2.2 Provide Transportation Choices

Many suburban areas of northeastern Ohio have only two options for traveling into Cleveland or to other major cities of the region—the private automobile and privately-operated, inter-city bus service provided by Greyhound and Trailways, which is more oriented to longer-distance trips than to short trips such as those from Cleveland to Akron or Lorain. Currently, public transit service in Ohio is offered on a county basis, with limited services crossing county lines. Exceptions include Laketran, in Lake County, which offers a freeway-based bus service to downtown Cleveland that parallels the NEORail Lake East corridor; and Akron METRO, which offers Cleveland service from Akron and Kent in the NEORail South corridor. These services operate primarily, if not exclusively, in the peak weekday morning and evening travel periods and primarily toward Cleveland. The routes have been popular and successful in terms of ridership. There is now no public bus service to Cleveland from Geauga, Medina, Lorain or Ashtabula Counties. As a result of a recently executed agreement between GCRTA, Akron METRO, Laketran and the regional transit authorities of Lorain and Medina Counties, each of these agencies now honor one another's transfers, making it possible to travel from these suburban counties to downtown Cleveland, or from county to county, on a single bus fare. However, schedules are not always coordinated between these services.

Commuter rail service provides another option for those who cannot or would rather not drive. It provides a transportation option that permits passengers to read, talk, work, sleep or otherwise use the time that they spend traveling in an activity other than driving. The availability of this option could result in changes in the location choices of both residents and employment sites in favor of areas and communities served by the commuter rail system.

2.2.3 Support Urban Core Areas

As noted above, historic and projected trends indicate that suburbanization will result in dispersion of a nearly static employment base and population throughout the area. This trend has developed over the past fifty years, and is projected to continue to some degree over the next 25 years. However, such trends need not be seen as inevitable, permanent or irreversible.

In addition to concentrating development around outlying stations, commuter rail service supports urban core areas, especially the central city that is the focus of a commuter rail network. The area around the central station of a commuter rail network has a unique advantage over outlying employment areas, in that it can draw workers from all over the region with inexpensive transportation service, to rival the free parking provided by outlying employment centers. Offering a commuter rail option provides employers in the central city with the opportunity to attract workers who prefer using public transit service to driving, and provides more options for all downtown workers. Commuter rail also offers residents of the region an alternative to driving and finding downtown parking – for access to museums, cultural and tourist attractions, recreational opportunities such as the Lake Erie waterfront, sporting events and other special events located in the large urban downtown areas.

2.2.4 Expanding Access to Jobs

In addition to supporting the central core of the region, the central business district, commuter rail service provides a spine on which can be built a reverse-commute transit system to provide inner city residents the opportunity to work in suburbs. For several years there has been a growing geographic disconnect between entry level and service jobs in the suburbs and large numbers of low skilled workers in inner-city neighborhoods, including those recently removed from the roles of public assistance under welfare reform. Concentrated in the central city, near the core of the urban bus network, commuter rail can provide a link between the urban local bus network and distant suburbs, where local buses or, in some cases, employer-provided shuttle can complete the trip to the suburban workplace. Thus, the commuter rail system provides a vital service for inner-city residents as well as suburban residents working downtown.

2.2.5 Other Factors/Benefits to Consider

In addition to supporting specific goals identified in the NOACA *Framework for Action 2025,* a commuter rail system would benefit the region in a number of other ways. Commuter rail would provide intangible benefits to help establish this region as progressive and forward-looking, and provides a first step toward further regional approaches to providing services. Commuter rail would also provide tangible environmental and capacity benefits to Northeastern Ohio's transportation system.

Regional Competitiveness

Regional competitiveness has been an issue in northern Ohio for more than 20 years. Restructuring of several basic manufacturing industries in the 1970s and 1980s led to employment and population loss in the region; more recently, corporate consolidations have resulted in job loss, particularly in downtown Cleveland and the region's other CBDs. Many growing regions of the country, including Dallas-Ft. Worth, Miami, Jacksonville, Atlanta, Charlotte, Seattle, Silicon Valley, Los Angeles, San Diego and others, have developed or are developing commuter rail service. The traditional benefits of relieving congestion and providing time and cost benefits have been seen as secondary in favor of the added convenience and travel options that the commuter rail service provides to residents and businesses. In addition, many cities are developing commuter rail to take advantage of intangible benefits it provides in terms of prestige and providing a focus for downtown urban development.

Although several other regions of the Midwest, including Milwaukee and Minneapolis, are exploring commuter rail, Chicago remains the only city in the US Midwest that is served by an extensive commuter rail system. Were northeastern Ohio to develop commuter rail in the next

5-10 years, it would be the first second-tier city in the Midwest to do so, accruing the prestige benefits in being the first to develop such a system, which could pay dividends in terms of attracting—and retaining—major employers and residents who desire an urban environment with this unique transportation amenity.

Environmental

Like all forms of public transportation, commuter rail provides an opportunity for environmental benefits over using the private automobile, benefits which can be calculated on a regional basis. Commuter rail is energy efficient, carrying passengers for less energy than would be consumed by private automobiles on a per-passenger basis. Shifting even a small percentage of auto trips to commuter rail would result in significant fossil fuels savings. This results in reduced auto tailpipe emissions, a major source of air pollution, and thereby improved air quality. In addition, the land use benefits that accrue to regions that develop commuter rail service result in preservation of agricultural and open space, and preservation of other natural resources that would be destroyed by sprawling development.

Regionalism

Northeastern Ohio consists of multiple counties and dozens of municipal jurisdictions. This protects the interest of local residents and businesses but limits regional approaches to shared problems and to achieving regional goals and opportunities. Development of a regional commuter rail system would be a truly remarkable and unprecedented regional achievement that many areas of northeastern Ohio would share, possibly providing a catalyst for further regional initiatives.

Capacity Creation

Given highway improvements that are currently planned and programmed by the metropolitan planning organizations, most of the highways in the region will still be congested during peak daily travel periods by 2025. Capacity on most of these facilities will be difficult to increase without costly (and potentially environmentally destructive) highway widenings or development of new roadways. Commuter rail is thus one additional means by which significant latent capacity can be produced in the transportation system on a regional basis.

Chapter 3: Commuter Rail Routes and Operating Plans

3.1 Commuter Rail Service Assumptions
3.2 Rail Network Characteristics
3.3 Description of Each Route
3.4 Access to Downtown Cleveland
3.5 Access to Downtown Akron

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CHAPTER 3 -
COMMUTER RAIL ROUTES AND OPERATING PLANS

3.1 COMMUTER RAIL SERVICE ASSUMPTIONS

3.1.1 Level of Service Standards

The Phase I study generated information concerning the size of the potential ridership market in each of the NEORail corridors. The general magnitude of the potential market in each corridor was found to be approximately the same. As a result, a range of three potential commuter service levels was defined to guide the Phase II analysis and provide a standard basis of comparison among the Phase II routes. These were defined, from lowest to highest, as Levels of Service (LOS) 1, 2 and 3. Table 3.2.1 presents the basic characteristics of the service provided at each level.

Table 3.2.1
Commuter Rail Generic Levels of Service

LOS 1	LOS 2	LOS 3
3 daily round trips (6 daily trains)	6 daily round trips (12 daily trains)	11-12 daily round trips (22-24 trains)
Peak period, peak direction service only	4 trains in peak direction in peak period 1 reverse peak train in peak period	5-6 trains in peak direction in peak period 3-4 reverse peak trains in peak period
45-minute peak headway	35-40 minute peak headway	30-35 minute peak headway
No off-peak service	1 mid-day round trip	Bi-hourly off-peak service

Each potential commuter rail corridor was evaluated at each of the three levels of service, in terms of ridership potential, operations and maintenance costs and the capital costs required to implement service at that level. In general, the higher levels of service require increasing investment in railroad infrastructure capacity and capability – to ensure that commuter traffic does not negatively impact rail freight operations and to permit bi-directional commuter operations at peak periods.

Level of Service (LOS) 1– Minimum service with no reverse-peak
Level of Service 1 provides the minimum amount of service considered sufficient to attract customers to commuter rail in reasonable numbers. It provides only rush hour service to the Cleveland central business district, with three trains operating inbound to Cleveland in the morning and the same three trains operating outbound in the evening peak. It does not serve

reverse-commute markets or trips from one side of the region to another, and it can serve only a very limited number of suburb-to-suburb commuter trips within a single corridor.

The time window for peak travel also is relatively small – limited to a period of 1 ½ to 2 hours in both the morning and afternoon. At LOS 1, there is a tradeoff between service frequency (headway) and the length of the peak window. Operating three peak trains at 45-minute headways would permit a peak period of 90 minutes. Lengthening peak headways to 60 minutes headways would extend the peak window to cover two hours.

In all cases, LOS 1 would require three revenue trainsets per route (not including spare equipment). This represents a relatively inefficient use of the equipment, since each trainset would make only one round trip per day (inbound in the morning, and out again in the evening).

There would be no commuter train meets (i.e., trains passing each other in opposite directions), so new passing sidings for commuter trains would not be required. LOS 1 also would have the least impact on the operations of the freight railroads who own the rights-of-way. This level of service is potentially compatible with the shared use of busy rights-of-way by both freight and passenger trains, provided that agreement can be negotiated with the right-of-way owner.

LOS 1, however, is not able to address several of the regional mobility and development goals articulated at the outset of the study, namely: improved mobility for the transit-dependent in the inner city, particularly with respect to access to suburban jobs. It also is unlikely to generate a sufficient critical mass of travel by rail to encourage concentrated land use development patterns around train stations or significantly stem the outflow of jobs from the large urban central business districts.

Level of Service (LOS) 2– Basic service with limited reverse-peak

This intermediate level of service adds more peak period service (4 peak direction trains plus one reverse-peak train) and adds one mid-day round trip. This level of service provides minimal reverse-direction and off-peak service. LOS 2 doubles the number of daily train movements from six to twelve. Peak headways are in the range of 35 to 40 minutes.

This level of service is more responsive than LOS 1 to the regional mobility and development goals, but the ability of commuter rail to capture significant numbers of reverse-peak and cross-region trips may be hampered by the limited number of reverse-peak and off-peak trains.
It offers improved equipment utilization, with each trainset making two daily round trips instead of one.

Commuter service at LOS 2 is potentially compatible with shared use of busy freight rights-of-way over short distances, subject to negotiated agreement with the right-of-way owner.

Level of Service (LOS) 3 – Basic service with full reverse-peak

A higher level of service also was identified, corresponding to 11-12 daily round trips (22-24 trains), including 5-6 trains in peak direction in peak period, at a 30-35 minute peak headway, plus 3-4 reverse peak trains in the peak period, and bi-hourly off-peak service. LOS 3 extends the rush hour period and offers the best equipment utilization compared with LOS 1 and LOS 2.

At this higher level of service, separate track and passing sidings for commuter trains will generally be required alongside busy rail freight lines.

There are many examples of U.S. commuter railroads that operate with shorter peak headways and higher numbers of daily trains than LOS 3. However, in the Northeast Ohio study area, LOS 3 is consistent with the expected overall volume of demand in the NEORail corridors. Higher-frequency service would likely not capture sufficient ridership to meet minimum standards for passenger loads and operating cost recovery. Similarly, this analysis did not consider zone express service, because the overall level of demand is considered to be too small to support such service at adequate load factors and cost recovery levels.

The number of daily commuter trains at LOS 3 (approximately 24) makes sharing of mainline tracks with freight traffic difficult on those segments of railroad that are already in heavy use by the freight railroads. Therefore, this level of service requires a higher level of construction of new mainline track than the lower levels of service, to reduce and, in some cases, eliminate negative impacts of the commuter service on the operational reliability of freight trains.

At LOS 3, the potential exists for weekend and holiday service. This analysis assumes the provision of approximately bi-hourly service on these days. As with other LOS special event service can be provided over and above these levels, to the extent that equipment is available and the revenues collected are sufficient to justify the incremental operating costs expended.

3.1.2 Trainset Requirements

Hypothetical commuter rail timetables were developed for each of the seven corridors, for each of the three levels of service standards. In addition, variations in the length of several corridors were explored (e.g., Elyria versus Amherst as the terminus of Route 2, Cuyahoga Falls versus Akron versus Canton as the terminus of Route 4, Aurora versus Mantua as the terminus of Route 6). Table 3.2.2 presents revenue trainset requirements for operating all of the combinations of service levels and route-length variations within each corridor. The total number of required coaches will be a function of estimated ridership, but, in general, trainsets are projected to consist of a locomotive with three coaches. Requirements for spare locomotives and coaches (to allow for routine maintenance, unscheduled repairs and overhauls) are not included in this table.

In general, LOS 1 requires three trainsets per route, regardless of the length of the route. LOS 2 is possible with three trainsets for the shorter routes, up to five or six trainsets on the longest routes. Except in the Lorain and Aurora corridors, expanding service to LOS 3 requires the acquisition of additional trainsets over and above LOS 2.

Table 3.2.2
NEORAIL Trainset Requirements

Route	LOS 1	LOS 2	LOS 3
	Trainsets/Locos/Coaches	Trainsets/Locos/Coaches	Trainsets/Locos/Coaches
1 Lake West	3 / 4 / 12	3 / 4 / 12	3 / 4 / 12
2 West	3 / 4 / 12	3 / 4 / 12	4 / 5 / 15
3 Southwest	3 / 4 / 12	3 / 4 / 12	4 / 5 / 15
4 South via Hudson	3 / 4 / 12	5 / 6 / 18	7 / 9 / 27
5 South via Kent	3 / 4 / 12	6 / 7 / 21	8 / 10 / 30
6 Southeast	3 / 4 / 12	3 / 4 / 12	3 / 4 / 12
7 Lake East	3 / 4 / 12	3 / 4 / 12	4 / 5 / 15

3.2 RAIL NETWORK CHARACTERISTICS

3.2.1 Right of Way Ownership

The Northeast Ohio study area is served by three mainline railroads: Norfolk Southern (NS), CSX Transportation and the Wheeling & Lake Erie Railroad. The seven potential commuter rail routes use portions of track owned by all three of these railroads.

Prior to the break-up of Conrail, both NS and CSX were relatively minor players in the rail freight business in the Northeast Ohio region centered on Cleveland. That has changed since Conrail was acquired and its routes and assets were divided between NS and CSX. Cleveland is now the focal point for east-west rail traffic on both railroads. Four mainline rail freight routes radiate outward from Cleveland. All are former Conrail lines and handle relatively high volumes of freight traffic (upwards of 50 train movements per day). They include:

- NS Chicago Line – Cleveland towards Toledo and Chicago
  Owned and dispatched by Norfolk Southern
  Double-track with sidings
  Route of Amtrak Capitol Limited, Lake Shore Limited and Pennsylvanian
  Route of potential future high-speed passenger service to Toledo & Chicago (Midwest Regional Rail Initiative)
  NEORail Route 2 (and portions of Routes 1 and 3)

- CSX Chicago Line – Cleveland towards Buffalo
  Owned and dispatched by CSX Transportation
  Double-track with sidings
  Route of Amtrak Lake Shore Limited
  NEORail Route 7

- CSX Big Four Line – Berea towards Columbus and Cincinnati
  Owned and dispatched by CSX Transportation

Recently double-tracked, Berea-Greenwich to support increased traffic
No current Amtrak service
Potential future high-speed passenger service to Columbus & Cincinnati (3-C Corridor)
Not considered to be a potential NEORail corridor

- NS Cleveland Line – Cleveland towards Alliance & Pittsburgh
  Owned and dispatched by Norfolk Southern
  Double-track
  Route of Amtrak Capitol Limited and Pennsylvanian
  Portion of NEORail Route 4 (and smaller portions of Routes 5 and 6)

In addition, there are a number of other freight lines that provide service in the Northeast Ohio region at lower levels of daily traffic. These include:

- NS Nickel Plate Line, westward from Cleveland to Lorain and Chicago, eastward from Cleveland to Ashtabula and Buffalo
  Owned and dispatched by Norfolk Southern
  Single-track with sidings
  No passenger service
  Portion of NEORail Route 1

- NS Randall Secondary, eastward from Cleveland to Aurora
  Owned and dispatched by Norfolk Southern
  Single-track
  No passenger service, and only sporadic freight service
  Portion of NEORail Route 6

- CSX Newcastle Subdivision (former B&O), eastward and westward through Akron
  Owned and dispatched by CSX Transportation
  Double-track
  Route of Amtrak Three Rivers

- CSX Cleveland Line, from Cleveland southwestward to Medina County
  Owned and dispatched by CSX Transportation
  Single-track with limited sidings
  No passenger service
  Portion of NEORail Route 3

- Wheeling & Lake Erie Railroad, from Cleveland southward to Kent
  Owned and dispatched by the Wheeling & Lake Erie
  Single-track with limited sidings
  No passenger service
  Portion of NEORail Route 5

- Akron Metro lines (several routes, centered on Akron)
  Owned by Akron Metro RTA
  Single-track
  Abandoned – no existing rail service
  Portions of NEORail Route 4 and 5.

Figures 3.2.1 and 3.2.2 show the current main and branch line railroad routes in the nine-county Northeast Ohio study area. The maps indicate current ownership and trackage rights for other railroads to operate.

Within Cleveland, NS and CSX have several alternative routings for their trains operating through the city, as Figure 3.2.2 shows:

- NS Pittsburgh – Chicago
- Primary route: via Cleveland lakefront
- Secondary route: via Short Line (trackage rights over CSX), using track connections at Harvard and Berea

1. NS Buffalo – Chicago
   a. Primary route: via Nickel Plate bridge over Cuyahoga River and Cloggsville connection to Clark St. branch (former Big Four) to Rockport Yard and Chicago mainline at Brook Park
   b. Secondary route: via Nickel Plate bridge over Cuyahoga River and Nickel Plate line to Lorain and Vermilion

2. NS Buffalo – Pittsburgh via Cleveland (infrequent use)
   a. Primary route: via Short Line (trackage rights over CSX) and Kinsman Connection track to NS Cleveland Line at Erie Crossing

3. CSX Buffalo – Columbus/Cincinnati/Chicago
   a. Primary route: via Short Line between Collinwood and Berea
   b. Secondary route: via Cleveland lakefront (trackage rights over NS), using CSX right-of-way from Collinwood to lakefront and track connection at Berea

In addition, NS and CSX have trackage rights over each other's lines in the Cleveland – Buffalo corridor. There are several locations where track connections exist between the two parallel lines.

3.2.2 Rail Freight Traffic

Table 3.2.1 presents the current level of freight activity, in terms of typical daily train movements, on each of the principal rail line segments in the Northeast Ohio study area. Table 3.2.2 presents historical traffic levels on these segments before the Conrail break-up, and contrasts them with current levels and projected future levels based on information submitted by NS and CSXT to the Surface Transportation Board at the time of the Conrail break-up.

Figure 3.2.1

Northeast Ohio Rail Network

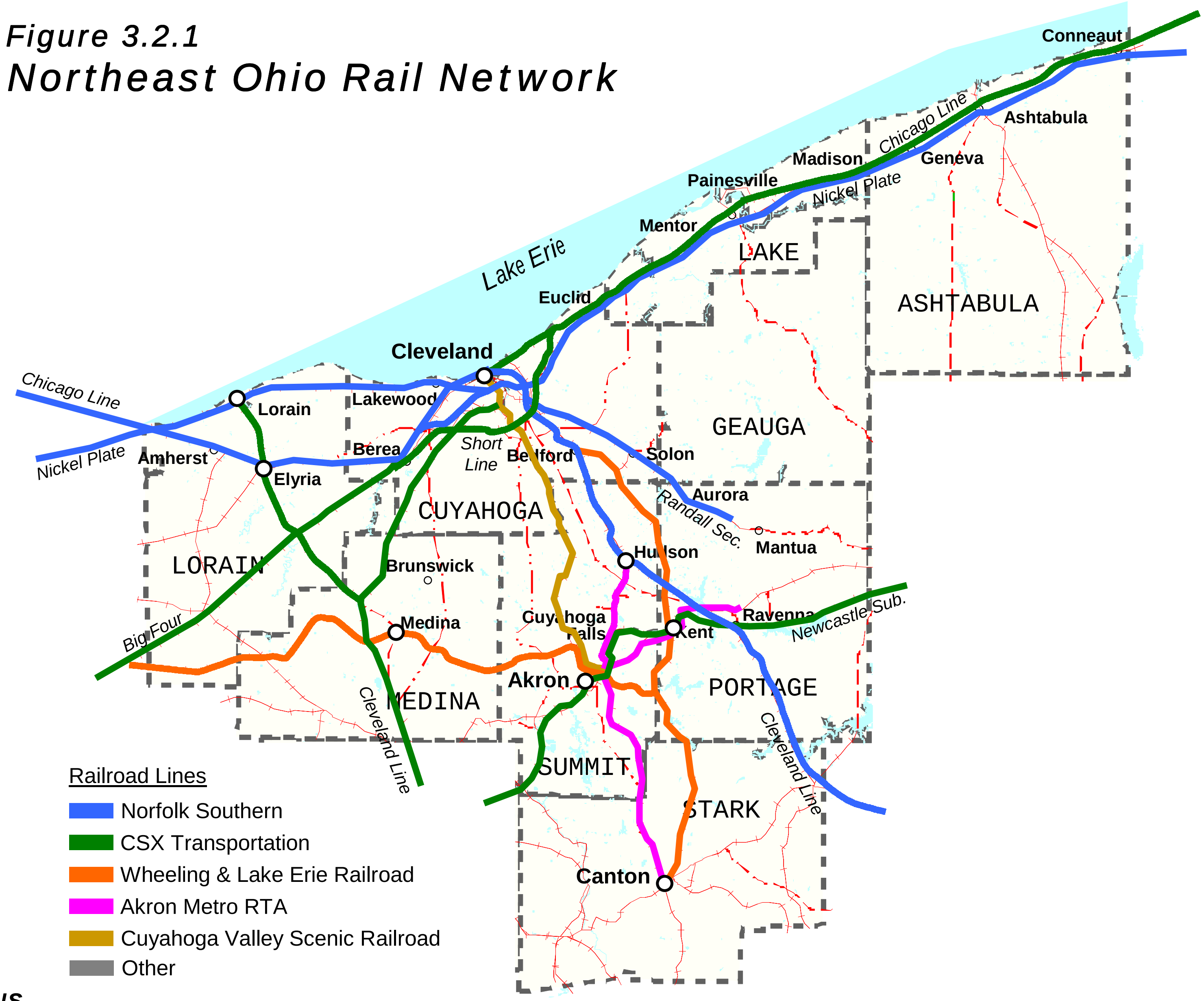
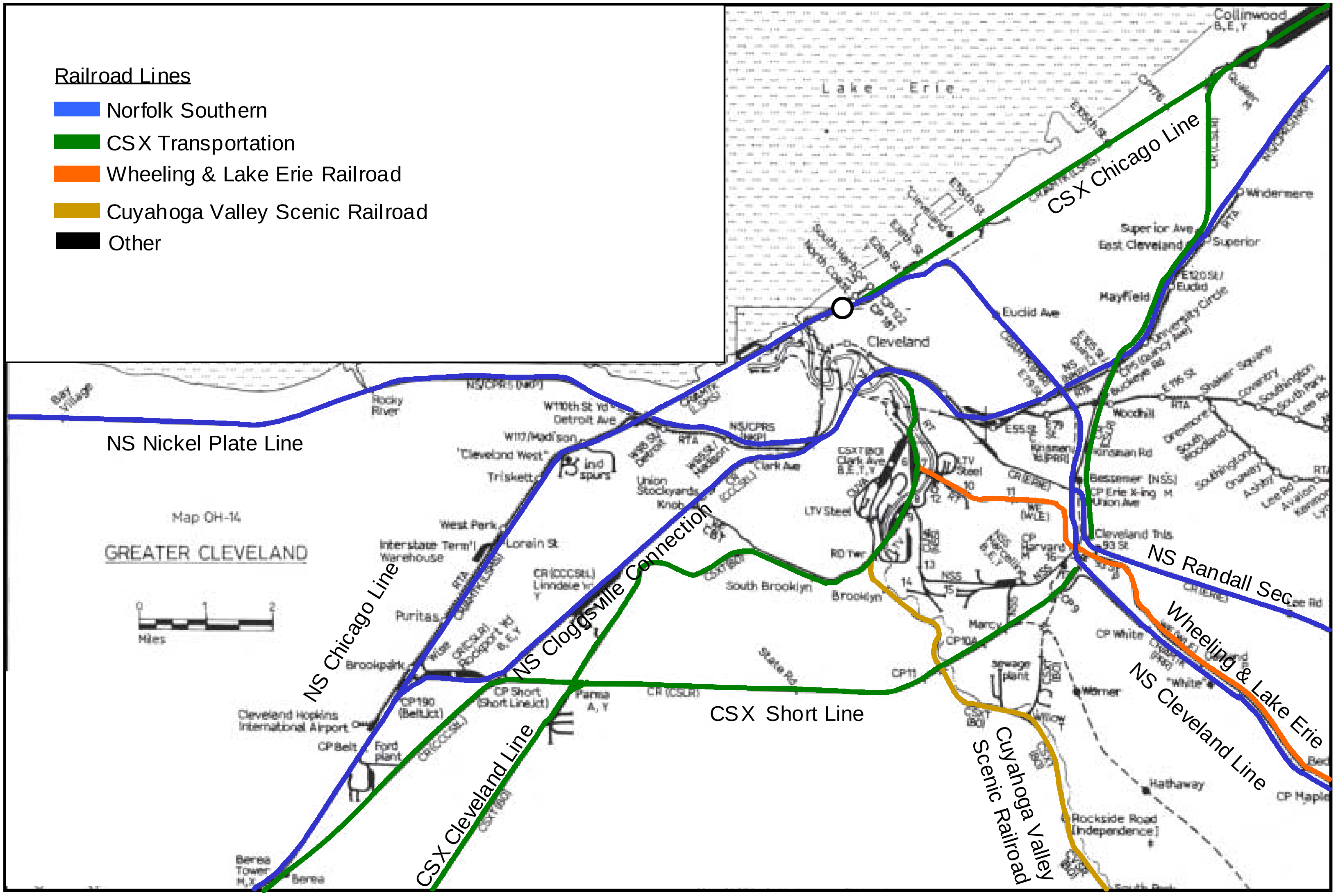


Figure 3.2.2

Cleveland Area Rail Network



The CSXT Newcastle Subdivision, the former B&O main line and the primary CSX east-west route between Chicago and Pittsburgh prior to the Conrail break-up, passes through Barberton, Akron and Kent and carries between 26 and 30 million gross tons of traffic annually.

The other rail lines in the study area are predominantly single track and carry less traffic. The NS Nickel Plate line (Route 1 to Lorain and the alternate Route 7 to Lake and Ashtabula Counties) handles on the order of 14 trains per day between Cleveland and Lorain and 16 daily trains between Cleveland and Buffalo. The Wheeling & Lake Erie line southeast of Cleveland (Route 5) has four daily trains. And the north-south CSX line through Medina County (Route 3) handles on the order of six daily trains.

With the acquisition of Conrail by Norfolk Southern and CSX, and the attendant reorganization and redistribution of rail freight traffic in the eastern U.S., track ownership and traffic patterns in Northeast Ohio have changed. Both CSX and NS have identified Northeast Ohio as a key location in their rail networks between the east coast and the Midwest. Both have projected future increases in traffic resulting from the merger. Figure 3.2.2 presents the existing and project future level of rail freight traffic on key rail links in the Northeast Ohio study area.

NS has agreed to limit traffic on the Nickel Plate Line between Cleveland and Lorain to no more than 16 trains per day. The bulk of their traffic will be routed over the Chicago Line through Berea. Traffic on this line west of Cleveland is projected to increase from 48 to 57 trains per day.

On the NS Cleveland Line between Bedford and Hudson, freight traffic has risen from the level of approximately 30 daily trains prior to the Conrail merger to approximately 65 daily trains. In this busy stretch of double mainline track, NS serves two major automobile assembly plants – Ford at Walton Hills and Chrysler at Twinsburg. Both auto plants are serviced from Motor Yard, which is located along a five-mile stretch of the line between Northfield and Macedonia. These two plants are located on opposite sides of the main line, so the main line tracks are often tied up by trains working the yard and the two auto plants.

The six-mile portion of the NS mainline closest to Cleveland has seen NS traffic increase considerably since the Conrail merger, from 13 to 30 daily trains, since the former Conrail bypass route using the Short Line from Harvard to Brook Park has been turned over to CSX and now is used by NS only on a contingency basis.

CSX traffic on the Short Line route, which bypasses downtown Cleveland and links Collinwood Yard with the new CSX line to Columbus, Indianapolis and Chicago, has seen its level of daily traffic increase from 16 to 46. CSX now uses the former Chicago Line route from Collinwood to Berea via the North Coast and downtown Cleveland only as a back-up route to the Short Line. CSX traffic between Collinwood and the North Coast, therefore, has decreased from a high of 53 trains before the Conrail merger to 13 or fewer trains per day.

The redistribution of freight rail lines between NS and CSX has been accomplished with limited major capacity investments in the Cleveland area. CSX has double-tracked most of the Short Line to accommodate its projected growth. NS has rebuilt a two-track line between Brook Park and Cloggsville to connect the Chicago Line to the west and the NS Nickel Plate line to the east.

Short Interlocking, on the Short Line just east of Rockport Yard, used to be a diamond crossing of the Short Line and the former Big Four line between Berea and downtown Cleveland. The diamond has been eliminated and the two railroads pass by each other at this location with only a minor track connection between them.

Table 3.2.1
Northeast Ohio Year 2001 Train Activity Levels

Line	Total Trains per Day	Intermodal	Merchandise	Unit	Local	Amtrak
CSX Transportation						
Cleveland-Painesville	52	15	28	3	4	2
Cleveland-NCTC/Drawbridge	6	--	--	--	4	2
Short Line	50	15	30	3	2	--
Berea- Greenwich	50	15	30	3	2	--
Cleveland-Medina	8	-	4	2	2	--
Newcastle Sub (Akron Mainline)	38	8	24	-	4	2
Norfolk Southern						
Cleveland-Hudson	66	21	27	6	6	6
Cleveland-Brook Park	68	21	27	6	6	8
Brook Park-Berea-Amherst	73	22	33	6	4	8
Nickel Plate East	20	2	12	2	4	--
Nickel Plate West	10	--	4	2	4	--
Cloggsville-Rockport-Brook Park	6	--	4	--	2	--
Randall Secondary -- Outer	0	--	--	--	--	--
Randall Secondary – Inner	2	--	--	--	2	--

Table 3.2.2
Northeast Ohio Historical, Current and Projected Future Train Activity Levels

Line	Pre-Merger	Post-Merger Forecast	Year 2001 Actual
CSX Transportation			
Cleveland-Painesville	50	55	52
Cleveland-NCTC/Drawbridge	55	14	6
Short Line	16	44	50
Berea- Greenwich	15	53	50
Cleveland-Medina	6	6	8
Newcastle Subdivision(Akron Mainline)	33	34	38
Norfolk Southern			
Hudson-Garfield Hts. (White)	26	41	66
Garfield Hts. (White)-Cleveland	13	40	66
Cleveland-Brook Park	48	54	68
Brook Park-Berea-Amherst	48	63	73
Nickel Plate East	13	26	20
Nickel Plate West	14	14	10
Cloggsville-Rockport-Brook Park	2	14	6
Randall Secondary -- Outer	0	0	0
Randall Secondary -- Inner	2	2	2

Otherwise, the track configuration in the Northeast Ohio study area has remained approximately the same. The two-track movable bridge across the Cuyahoga River on the Chicago Line, which opens regularly for recreational boating traffic during the Spring-to-Fall season, will continue to be a bottleneck point. The total volume of rail traffic through Berea will increase considerably, although fewer crossover movements between the two lines will occur there. Grade separation of the Front Street crossing in Berea will help mitigate the impact of increased rail traffic on the adjacent community. Also, there will be fewer merging and diverging freight train movements at the North Coast site in downtown Cleveland, although the total number of train movements will remain about the same.

The actual traffic patterns and implications for commuter rail service in Northeast Ohio remain unclear two years after the merger. Both NS and CSXT are still in the process of evolving their networks and service patterns to reflect the new eastern network configuration. Table 3.2.3 classifies the major railroad line segments according to the degree to which introducing commuter trains will potentially affect rail freight operations.

In all cases, these effects can be mitigated by capital investment to increase line capacity or separate commuter and freight train flows (either by means of new parallel track construction or grade separated crossings).

Table 3.2.3
Potential Impact on Rail Freight Operations of Introducing Commuter Trains onto Existing Mainline Freight Tracks

High Impact	**Moderate Impact**	**Low Impact**
NS (Conrail) Chicago Line towards Chicago Routes 1, 2, 3	NS Nickel Plate Line towards Lorain Route 1	NS (Conrail) Randall Secondary Route 6
NS (Conrail) Cleveland Line towards Pittsburgh Routes 4, 5 & 6	NS Nickel Plate Line towards Conneaut Alternate Route 7	Wheeling & Lake Erie Railroad Routes 3, 5
CSX (Conrail) Chicago Line towards Buffalo Route 7	CSX Newcastle Subdivision at Akron Route 4	CSX Cleveland Line, Medina-Lester-Cleveland Route 3

3.2.2 Route Segment Classification

A series of Northeast Ohio rail network maps shows some of the important characteristics of the existing rail lines in the study area. Figure 3.2.3 presents the maximum authorized speed and FRA Track Class of each railroad and line segment. Figure 3.2.4 identifies single-track, double-track and multiple-track segments. Figure 3.2.5 indicates the relative degree of difficulty associated with adding line capacity (i.e., constructing additional mainline tracks) along various segments of the right-of-way. There are significant differences among the various corridors. Replacing or reinstalling tracks where they used to exist on 4-track rights-of-way is a relatively straightforward process. Adding a third track to a double-track line that passes over river gorges, alongside steep slopes and through town centers is a much more difficult and costly proposition.

3.2.3 Network Constraints

The unique characteristics of each potential commuter rail route are documented in Section 3.3 below. However, it is useful to look at the big picture of freight and passenger rail traffic patterns in Northeast Ohio. In general, the study area is blessed with excellent coverage by existing active railroads and inactive but available former rail rights-of-way.

However, Northeast Ohio also has become the nexus for east-west rail traffic for each of the two railroads that have become dominant in the long-haul market in the eastern U.S., namely Norfolk Southern and CSX. They are operating at traffic levels that effectively use up the majority of the available capacity on their main lines. They also are very sensitive to anything that might negatively affect the reliability of their service. Therefore, adding significant numbers of commuter trains onto existing tracks without making significant investments in additional capacity will be perceived by the railroads as harming the reliability of their freight service.

Specific rail system bottlenecks are identified in Figure 3.2.6. Many of these bottlenecks apply to multiple potential NEORail routes. These include:

- NS Cuyahoga River crossing – double-track lift bridge
- NS Bedford-Walton Hills – Tinkers Creek Crossing, severe topography and historic highway bridges
- Erie Crossing / Harvard diamond track crossings and slow-speed connections
- NS Motor Yard and Twinsburg (Chrysler) branch line
- NS Alcott-to-Brook Park main line
- NS Brook Park / Hopkins Airport vicinity
- Berea – NS and CSX junction
- CSX Collinwood Yard
- CSX Short Line
- East Cleveland (Short Line)
- CSX Arlington Jct. (Akron).

The existence of these bottlenecks results in the need for significant capital investment to create capacity in a manner that enables commuter rail service to be initiated while protecting the reliability and future growth potential of rail freight.

Figure 3.2.3

Northeast Ohio Rail Network Maximum Speeds for Passenger Trains

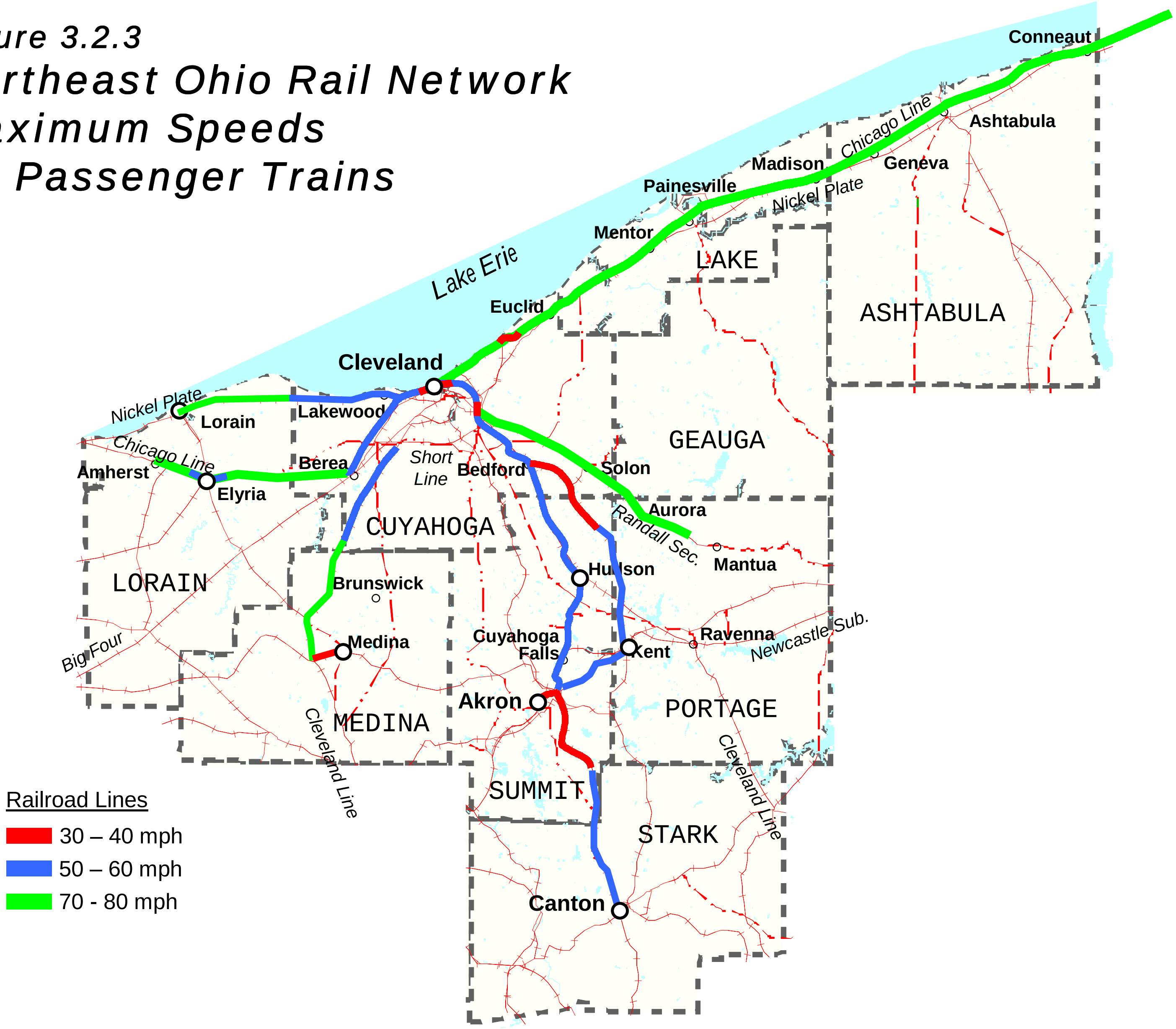


Figure 3.2.4

Northeast Ohio Rail Network
Number of Mainline Tracks

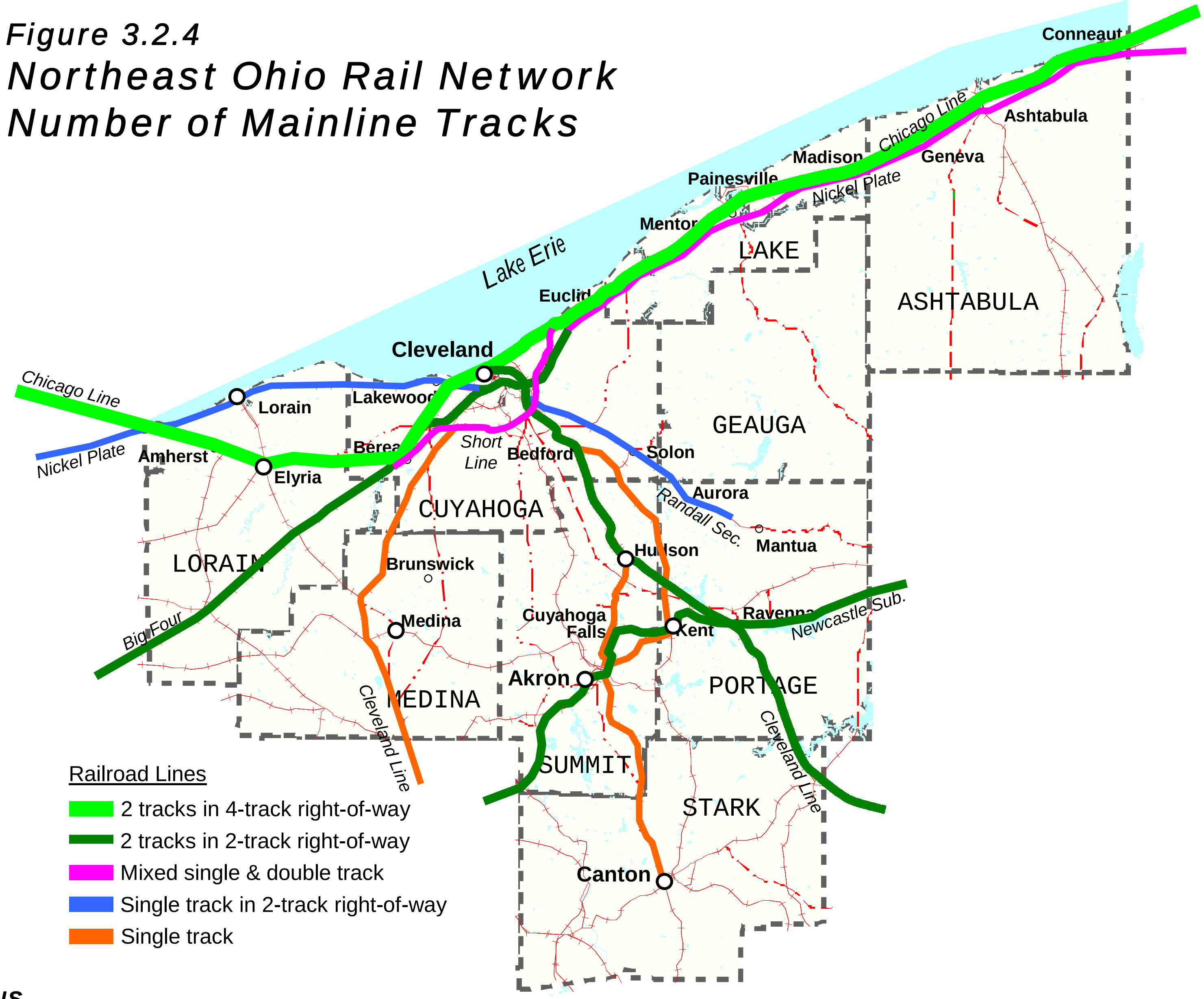
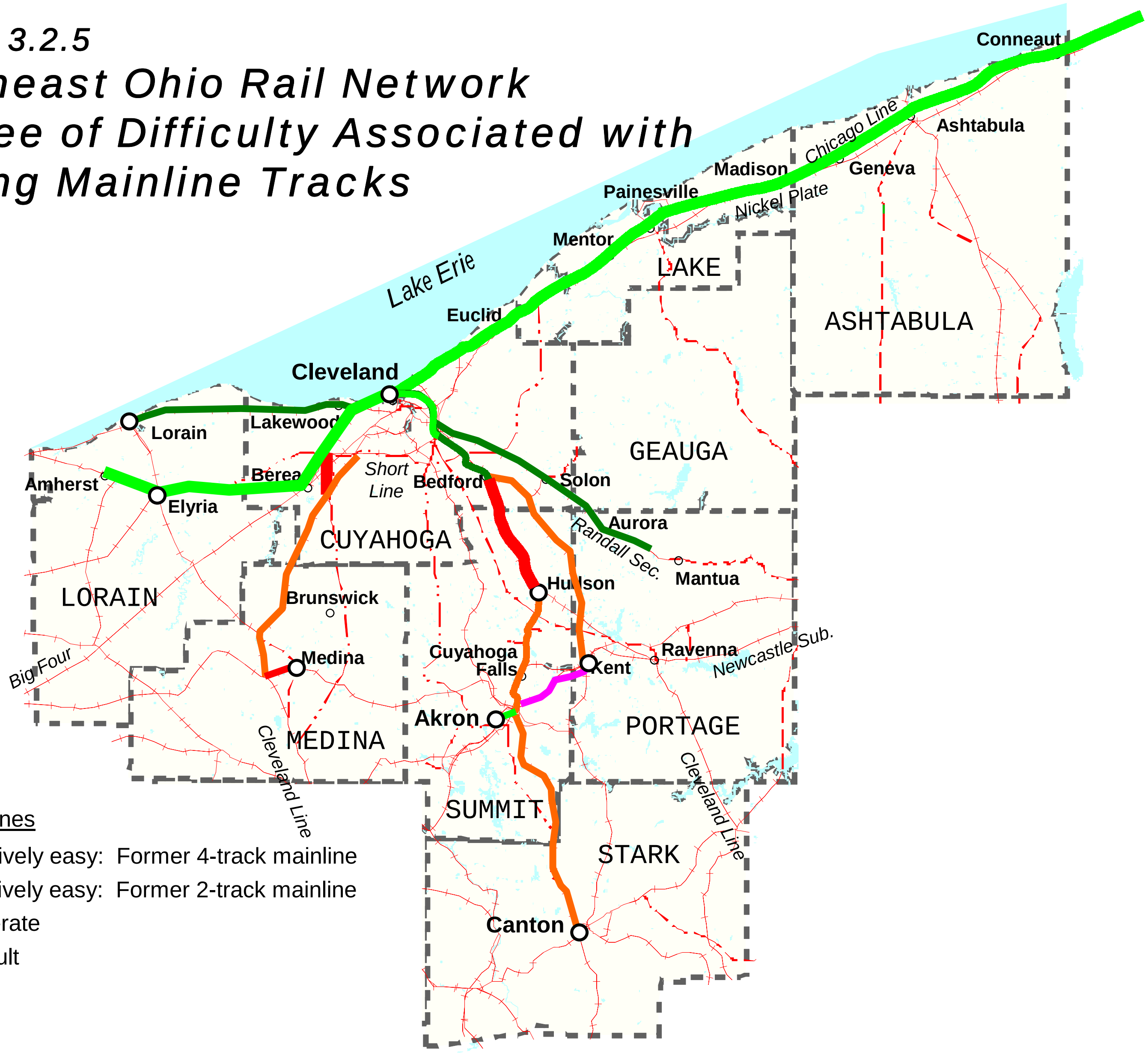


Figure 3.2.5

Northeast Ohio Rail Network Degree of Difficulty Associated with Adding Mainline Tracks



Railroad Lines

🟩 Relatively easy: Former 4-track mainline

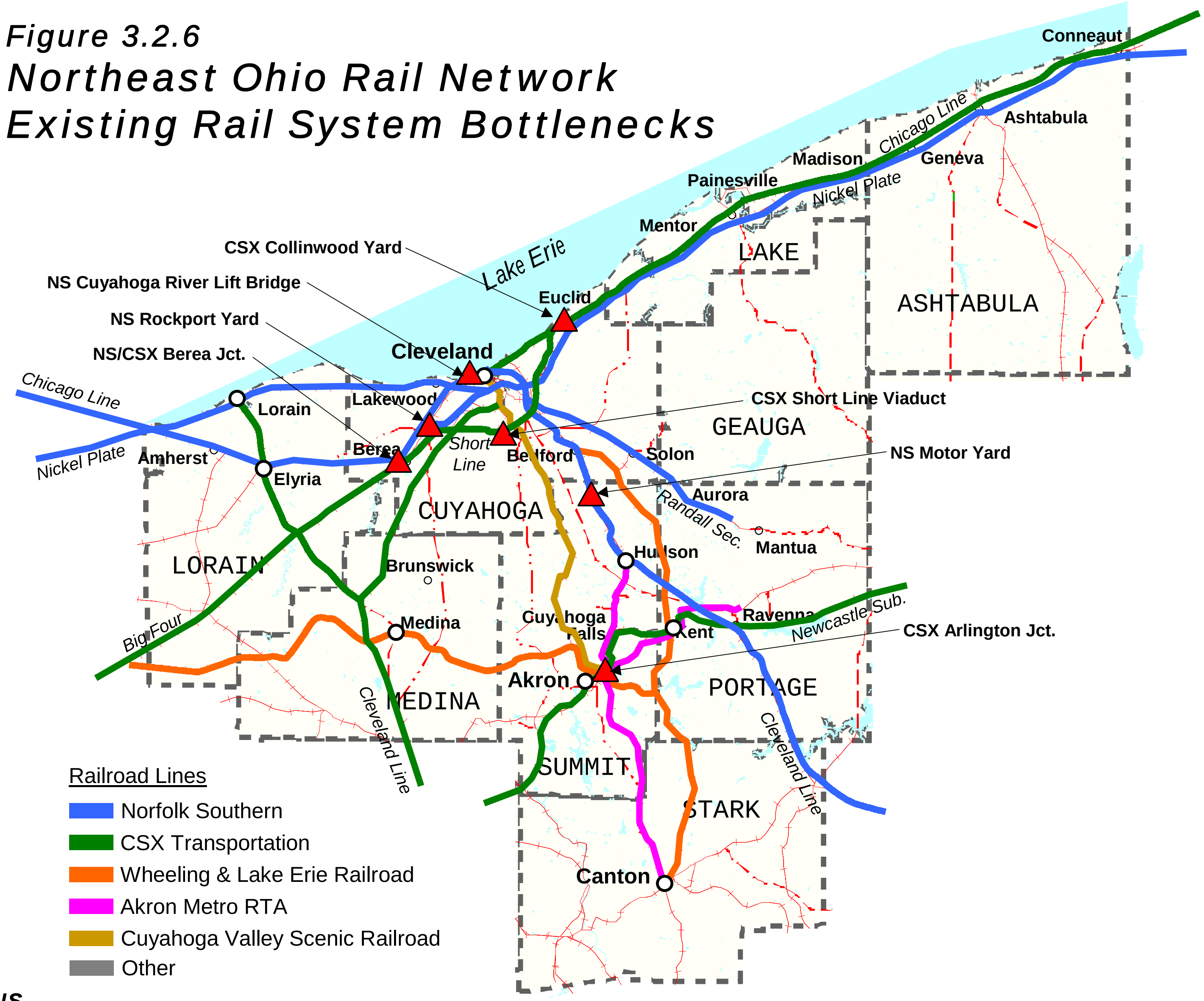
🟩 Relatively easy: Former 2-track mainline

🟧 Moderate

🟥 Difficult

Figure 3.2.6

Northeast Ohio Rail Network
Existing Rail System Bottlenecks



3.3 DESCRIPTION OF EACH ROUTE

A summary of the important distinguishing characteristics of each potential commuter rail route is presented below. The appendices to this report contain additional information on the assumed track configuration, required rail infrastructure projects, station locations and characteristics, and estimated capital costs. This information formed the basis for the comparative evaluation of the routes and possible route combinations in the NEORail Phase II study, including the preparation of ridership and cost estimates. The list of potential stations on each route includes a mix of town center and park-and-ride locations, based on input from local stakeholders, and representing a reasonable set of assumptions for feasibility analysis and decision-making. Actual locations and implementation priorities may change as the design and implementation process progresses. The final determination of rail capacity needs, infrastructure projects and station locations will be made later in the implementation process, following additional studies, public reviews, and negotiations with the railroad right-of-way owners.

3.3.1 Route 1 – Lake West Corridor, Cleveland – Lorain

Physical and Operational Characteristics of the Line

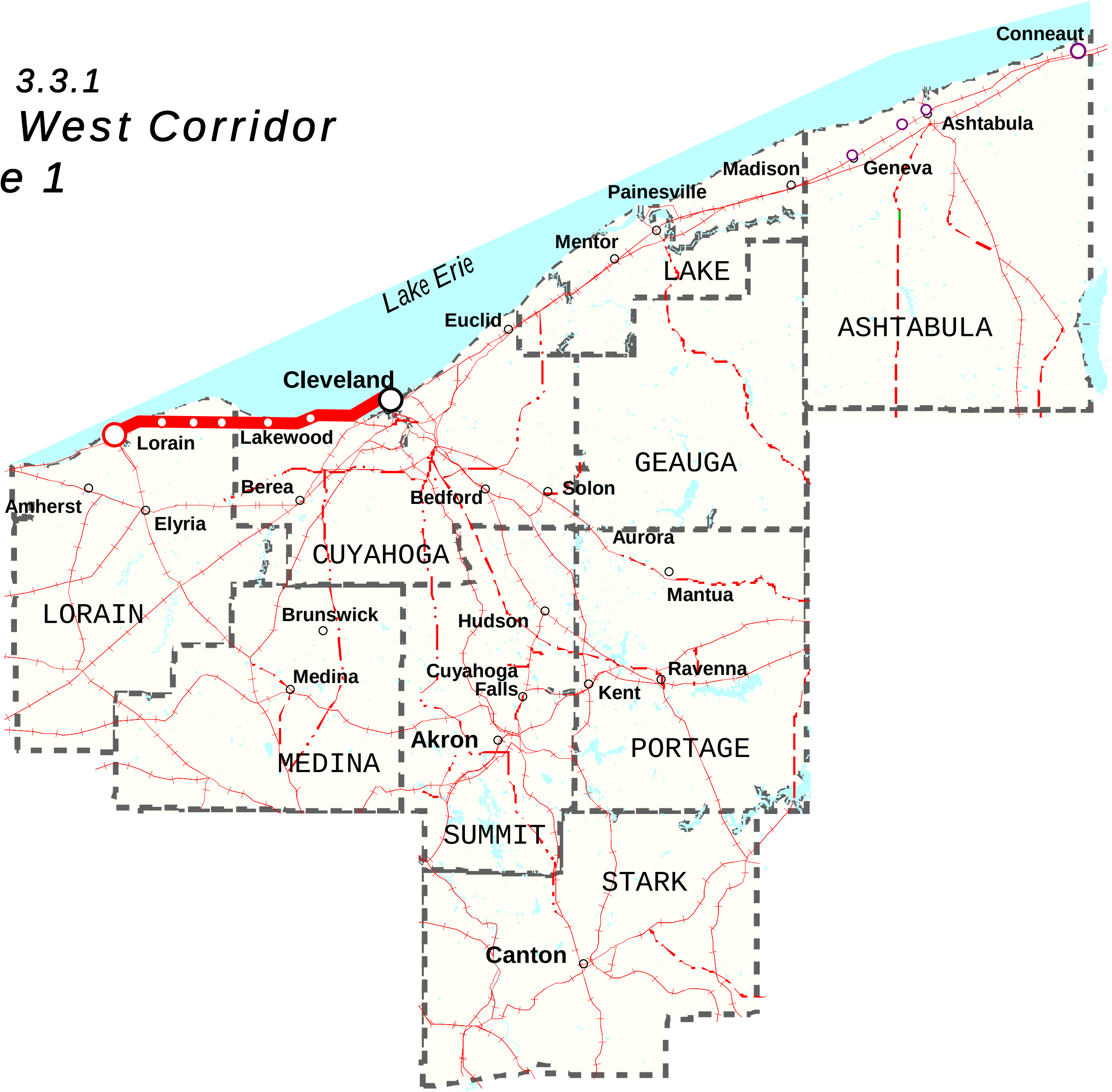
Route 1 follows Lake Erie westward from Cleveland, serving downtown Cleveland, the west side of the City of Cleveland, and the communities of Lakewood, Rocky River, Westlake, Bay Village, Avon, Avon Lake, Sheffield, Sheffield Lake and Lorain (see Figure 3.3.1). This route is approximately 24 miles long. The typical travel time by rail from Lorain to downtown Cleveland is approximately 40 minutes.

The downtown Cleveland station is at the proposed North Coast Transportation Center (NCTC), located between West 3rd and East 9th Streets along the lakefront. The exact location and configuration of the NCTC will depend on the results of other planning studies impacting the lakefront area. Proceeding west from Cleveland, Route 1 follows the double-track Norfolk Southern (former Conrail Chicago Line) mainline for approximately two miles, crossing the Cuyahoga River on a lift bridge. This bridge constrains the capacity of the line, since it must open regularly during the boating season to permit lake freighters, excursion boats and high-masted pleasure craft to pass between Lake Erie and the river.

From Alcott Jct. to Lorain, a total of 22 miles, the route follows the Norfolk Southern former Nickel Plate line. The Nickel Plate line is predominantly single track, but the original right-of-way is two tracks wide.

A former track connection at Alcott Jct. must be restored between the two lines now owned by NS, in order to provide a route for commuter trains. A realignment of the connection is recommended to improve the speed of commuter trains as they transition from one line to the other and to increase the buffer distance to residential properties adjoining the right-of-way (see Figure 3.3.2. To minimize impacts on rail freight operations, the Alcott connection track will be tied into the Chicago Line just west of the Cuyahoga River lift bridge. It will tie into the Nickel Plate Line just east of the West 110th Street grade crossing.

Figure 3.3.1
Lake West Corridor
Route 1



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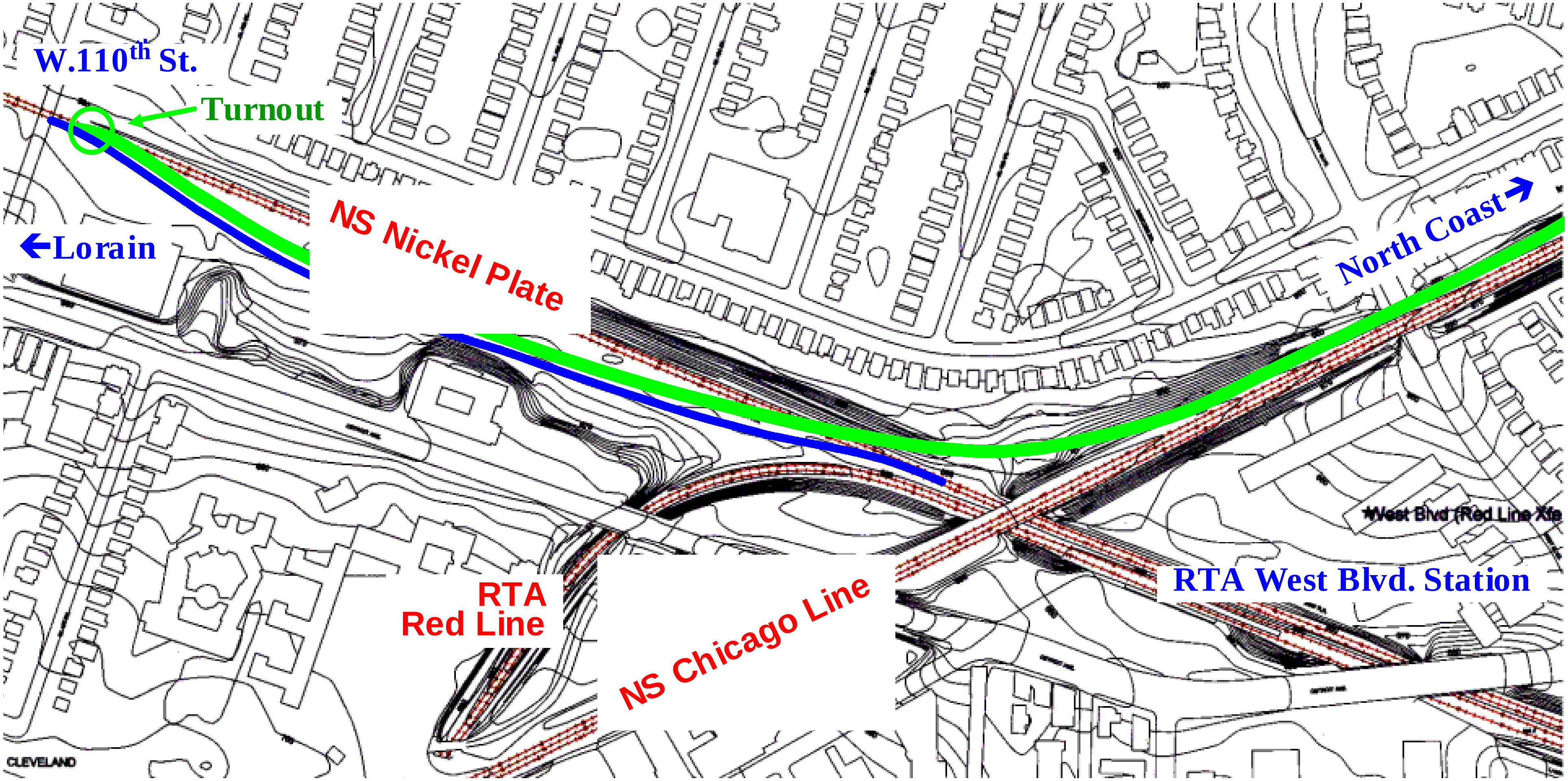
December 2001

Figure 3.3.2

Alcott Junction Connection



A distinguishing feature of this route is the high number of grade crossings (over 60), given the relatively short length of the route – including grade crossings at almost every block (33 crossings in approximately three miles) through the City of Lakewood.

The proposed terminal station location in Lorain is at the Grove site, adjacent to the central business district, which is in the process of being redeveloped by the Lorain County Port Authority, with a proposed rail station as the centerpiece of the development. This site requires a short rail spur from the Nickel Plate main line.

The quantity of freight traffic on the Nickel Plate Line has declined significantly since the Conrail break-up occurred. An agreement made by Norfolk Southern at the time of the Conrail acquisition limits freight traffic on the Nickel Plate Line to 16 daily trains or less. Actual daily activity currently is running at approximately ten freight trains per day, with most NS through trains now routed via the Chicago line (through Berea and Elyria). Implementing commuter rail at Level of Service 1, 2 or 3 is possible on this line with three revenue trainsets (not counting spare equipment).

Capacity Opportunities and Constraints

The NS agreement to limit freight traffic on the Nickel Plate Line, and their apparent success at diverting NS traffic from the Nickel Plate Line to the Chicago Line, creates substantial residual capacity on this line that represents an opportunity for the introduction of commuter rail service at a reasonable cost. The existing track and signal system are in relatively good condition and do not require major upgrading or investment. The mayors of the four western lakeshore communities in Cuyahoga County (Bay Village, Lakewood, Rocky River and Westlake) through which the Erie-Nickel plate alignment (portion of Route 1) would run, have expressed their opposition to increased rail service through their cities, and specifically their opposition to commuter rail service. Congressman Dennis Kucinich, who represents the area in the US Congress, helped the west lakeshore mayors negotiate a reduction in freight rail service through the area in 1999, and is also opposed to the development of commuter rail through this area. Lorain County, on the other hand, has expressed strong support for commuter rail service in this corridor and is investing in a future commuter rail station facility in downtown Lorain.

A major constraint at Level of Service 1 and 2 is the assumed shared use of the Cuyahoga River lift bridge by commuter and freight trains. (At Level of Service 3, a new parallel bridge is assumed to be required.) Agreement will be required with NS before this service can be operated. It is expected that the proposed Erie-Nickel Plate connection, described in Section 3.4.3, will enable NS to divert more trains away from the lakefront lift bridge than will be added by the Lorain commuter service. Regardless, Route 1 requires only one mile of shared track with NS (from the Cuyahoga River lift bridge to the NCTC).

The grade crossings, particularly in Lakewood, will need to be the subject of detailed study prior to implementation of commuter rail service. Provision of safe crossings is of paramount importance, and investment in enhanced grade crossing protection is included in the project cost of implementing commuter service on this line. The noise generated by train whistles at crossings also is an important issue. By the time service is implemented, grade crossing protection technology and design standards are likely to have progressed to the point where crossings can be designed safety enough to avoid the need for trains to blow their whistles in advance of every grade crossing. A third issue relates to the impacts of commuter train operations on traffic levels and vehicular delays at grade crossings. The NEORail commuter trains are projected to be only three cars long and are projected to cause crossing gates to close for approximately the same length of time as a typical traffic signal (i.e., less than one minute) – unlike freight trains, which can consist of 100 or more cars and take several minutes to pass through a crossing. At the height of rush hour, a commuter train would operate through Lakewood approximately every 20 minutes or so. The impact of these operations on traffic flow and vehicular delays, therefore, is expected to be minimal.

The service headway on this line is constrained to the 35-40 minute level by the relatively long stretches of single track. The single track stretch from the NCTC to Rocky River, including the City of Lakewood, would be relatively costly to double track, due to grade crossings and the Rocky River viaduct. Extension of double-track as required west of Lakewood, on the other hand, would be relatively easy, since the line historically was double track.

Commuter operations will need to work around any freight operations at the existing yard in Avon. Sidings are provided at several locations where freight trains may be stored during the times of day when commuter trains are operating.

NS has agreed to limit the number of freight trains using the former Nickel Plate line to Lorain to 16 daily freight trains or less, which means that ample capacity exists on this line for running commuter trains, and the introduction of commuter service should be relatively easier than on Route 2 (via Elyria and Amherst).

While NS is not normally supportive of commuter rail trains using their main tracks, the proposed inclusion in the Route 1 project of the Erie-Nickel Plate connection offers considerable operational and capacity benefits to NS, which should compensate for the impact of a small number of Lorain commuter trains using the lakefront lift bridge.

The lower levels of service to Lorain limit the number of trains to those that can be accommodated on the existing lift bridge, by agreement with NS. When and if additional capacity across the Cuyahoga River is provided, service on this line to downtown Cleveland can be increased to LOS 3. In the interim, the Nickel Plate line west of Alcott Jct. will support LOS 3 commuter service, so it would be possible to operate additional trains on the line between Lorain and West Boulevard, with a passenger transfer to the GCRTA Red Line – until such time as the capacity improvements across the Cuyahoga River are made.

Major Capital Projects

A former track connection between the NS Chicago and Nickel Plate lines at Alcott Jct. must be restored to enable this route to operate. Grade crossing protection upgrades will be needed, for safety and to enable whistle-free operation. Other significant capital investments include station facilities, a track connection into the proposed terminal site at Lorain, extension of the passing sidings at Rocky River and Avon (for LOS 2 or LOS 3), and an allowance for rail capacity improvements at the Cuyahoga River bridge crossing.

A train storage and maintenance facility will be needed at Lorain, to provide capacity for overnight storage of up to four trainsets. This facility also should have the capability of performing overnight servicing and inspection, as well as minor maintenance and repairs, so that the number of required non-revenue train movements across the Cuyahoga River lift bridge can be minimized. A mid-day storage yard and maintenance shop are assumed to be built near downtown Cleveland, at the E.26th Street yard site. This facility will be designed to be implemented in stages and will ultimately serve the heavy maintenance needs of a full Northeast Ohio commuter rail network.

Station Locations

The following station locations along Route 1 have been assumed for purposes of ridership estimating and capital costing.

Table 3.3.1
Potential Commuter Rail Stations – Route 1 – Lake West Corridor

Station:	**Street location:**	**Transit connections**	**Type**
Cleveland – North Coast Transportation Center		LRT, buses	
West Boulevard*	E.98th St., Detroit Ave., West Blvd.	Red Line Rapid Transit, buses	
Lakewood	St. Charles Ave.	Buses	T
Rocky River	Former station location		T,P
Westlake / Bay Village	Columbia Rd.		P
Avon	SR 83		P
Sheffield / East Lorain	Lake Breeze Rd.		P
Lorain Grove Site	US 6 & Broadway		T,P

T=town center; P=park and ride available.
* Not included in Phase II ridership and cost estimates.

West Boulevard station offers a location from which residents of the west side of the City of Cleveland can access the commuter rail system. It also provides an opportunity for passengers to transfer between commuter rail and the GCRTA Red Line rapid transit. A Red Line station already exists at this location and has been fully renovated within the past year. Building a commuter rail station platform alongside the Alcott connection track, on the route between Lorain and the NCTC, would be feasible but expensive, because the commuter track at this location is in a curve and on a steep grade as it transitions from the Conrail Line to the Nickel Plate Line.

A less expensive alternative would be to build a station platform on the existing Nickel Plate track immediately adjacent to the Red Line station. Situated east of the Alcott Jct. connection, this platform would not be usable by trains operating to or from the NCTC. However, this location could become a desirable turn-back point for additional trains on the Lorain line, since the number of commuter trains permitted by NS to operate across the existing Cuyahoga River lift bridge is expected to be limited. Though not included in either the ridership or cost estimates for

Route 1, a station at this location should be considered in future planning for rail service in this corridor. An alternate station location within the City of Cleveland would be West 117th Street, which offers relatively good bus connections but doesn't link with the Red Line rapid transit.

Lakewood has the highest density of adjacent development, with the potential for significant numbers of people to walk to the station, but a single location would be accessible on foot from only a portion of the city. The availability of parking, therefore, is the key to finding a single, preferred station location within Lakewood.

A station situated at St. Charles Avenue could potentially take advantage of a nearby public parking garage (primarily used for Lakewood Hospital).
Open space adjacent to station could be developed for vehicular pick-up/drop-off and pedestrian access to the platform. No significant parking opportunities were identified at other locations within Lakewood.

In Rocky River, the station is proposed to be located at the former passenger station site, which has an existing parking lot that could be used by commuter rail patrons. Users of the existing parking lot may be displaced by rail commuters, which may require construction of additional parking elsewhere.

At Westlake / Bay Village (Columbia Road), the station would be built immediately adjacent to the existing park-and-ride lot, which is heavily-used today by express bus patrons. It is expected that the rail service will replace the existing I-90 express bus service to downtown Cleveland.

At Avon and Sheffield, the proposed stations are located at major north-south roadways serving the heart of the adjoining residential communities. The suggested sites also avoid the Avon rail yard, where construction of platforms and pedestrian access to the platforms would be more difficult and costly.

At Lorain, the Grove Site was the preferred station site in Lorain. It is a large, vacant tract of land, situated adjacent and parallel to the main commercial street of downtown Lorain. It has ample space for required rail tracks and station facilities. Available land exists at south end of Grove site for the required end-of-the-line train storage and maintenance facilities, although the development plans for the site will need to be modified to include provision for these facilities. The sole disadvantage of the Grove site is the fact that it does not lie along the mainline right-of-way, which makes future extension of commuter service to the west of Lorain difficult. The strong local support and committed funding for development of the Grove site, and its proximity to the Lorain central business district, coupled with the lack of an identified significant commuter rail market to the west of Lorain, favor the Grove site as the logical terminus of this route.

3.3.2 Route 2 – West Corridor, Cleveland – Elyria – Amherst

Physical and Operational Characteristics of the Line
A second potential commuter rail route also serves Cleveland, western Cuyahoga County and Lorain County. Route 2 follows the Norfolk Southern (former Conrail) Chicago Line from downtown Cleveland westward to Elyria and Amherst. Outside of Cleveland, it serves the communities of Brook Park, Berea, Olmsted Falls, North Ridgeville, Elyria and Amherst (see Figure 3.3.3).

Traveling by rail from Cleveland to Elyria would take approximately 40 minutes. The route from Cleveland to Amherst is approximately 29 miles long – similar in distance, travel time and the potential size of the ridership market to the Cleveland-Lorain route. The major suburban location on this route is Elyria, about 26 miles from downtown, which is the Lorain County seat and has significant concentrations of both population and employment. The major drawback for commuter service on this route is the very heavy volume of freight traffic on the two-track Norfolk Southern main line. This line has become a principal east-west route for NS and has absorbed the traffic diverted from the Nickel Plate Line subsequent to the Conrail break-up.

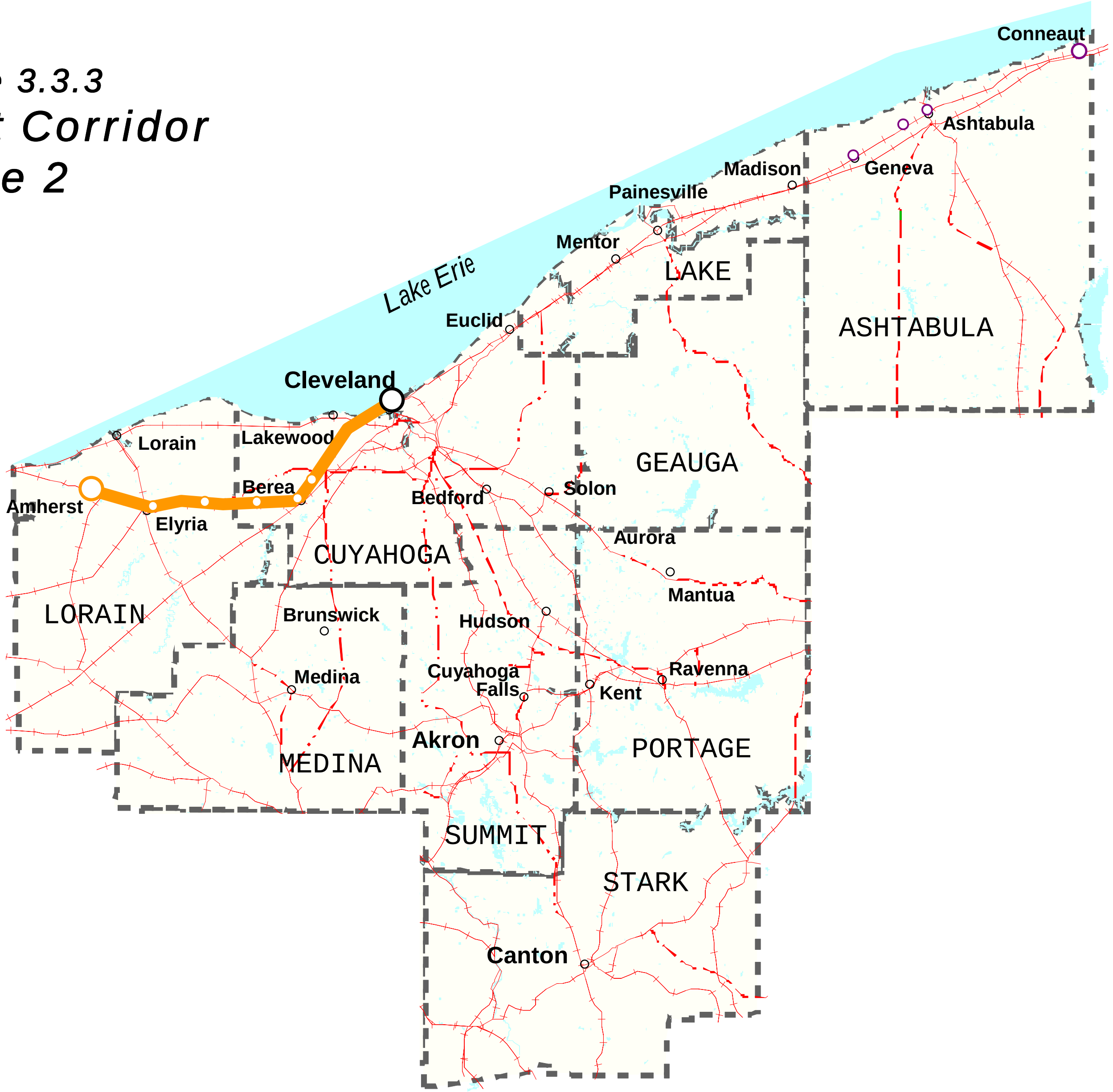
In addition to the Cuyahoga River bottleneck, the right-of-way width is constrained through the vicinity of Hopkins International Airport and Berea. Elsewhere, right-of-way generally exists to reinstall a third track, and even a fourth track, for commuter use where necessary.

The right-of-way from the Cuyahoga lift bridge to Alcott Jct. is four tracks wide, occupied by the two main tracks plus a long siding. The Lorain route would occupy the fourth track slot between the lift bridge and Alcott. The siding, which runs all the way to Brook Park, would be converted to a third mainline track. To the west of Alcott Jct., the width of right-of-way for track expansion is constrained by the presence of the GCRTA Red Line, which occupies two track slots on the north side of the right-of-way as far west as Hopkins Airport.

There are numerous overhead and undergrade bridges that cross the right-of-way between Alcott and Brook Park. All of these will permit three mainline tracks for freight and passenger service without modification. Some of them can support the addition of a fourth track. Others, however, notably the bridges carrying I-71 and I-90 across the right-of-way, would require major structural modifications to accommodate a fourth track with standard horizontal clearances between track centerlines.

There is an existing freight yard at West Park. It would be possible to install a fourth track, as a freight passing siding, for approximately 1½ miles in the vicinity of West Park.

Figure 3.3.3
West Corridor Route 2



It may be possible to reduce the capital cost of improvements in this corridor, if the Erie-Nickel Plate connection proves to be successful in diverting a relatively large share of the NS through traffic from the lakefront route to the Nickel Plate route across the Cuyahoga River. If this is the case, the mainline route might have sufficient line capacity for freight service, commuter service and potential intercity high-speed passenger service to Chicago and Columbus/Cincinnati with three mainline tracks between Alcott Jct. and Brook Park, plus a siding at West Park. The existing siding could be upgraded to serve as a third mainline track at a relatively low cost. Should a 4-track mainline be required from Alcott to Brook Park, extensive bridge reconstruction would be required to create the right-of-way necessary to support four tracks. The capital cost estimates for commuter rail at LOS 1 and 2 assume a three-track mainline, while the estimates for LOS 3 include the additional costs of providing four tracks in this area.

In the vicinity of Hopkins Airport, the passenger rail alignment could either follow the existing rail right-of-way or follow a new alignment into the airport proper, serving a potential new multi-modal transportation center attached to the air passenger terminal building. Though not currently in active planning, the concept of such a terminal could provide an important linkage between the airport and passenger rail – including both commuter rail and the intercity high-speed rail lines that are proposed to serve Cleveland. The assumed railroad configuration in this area is described in more detail below.

West of Berea, the former New York Central right-of-way is generally four tracks wide. Some newly-built or re-built bridges across the right-of-way do not preserve enough space for additional tracks and may have to be modified to accommodate one or two additional commuter tracks. Freight passing siding capacity needs to be preserved. Some sidings would have to be relocated. Selected bridge spans will require reconstruction, some shifting of freight mains/sidings may be required to create space for a new passenger track. However, costs of construction in this area are reasonable, compared with the difficulty of creating a passenger right-of-way through the airport area.

High-speed rail service may require additional costs, for signaling, grade crossing protection, grade crossing elimination, and provision for increased clearance between centerlines of existing freight and new passenger tracks. These costs have not been factored into the NEORail estimates.

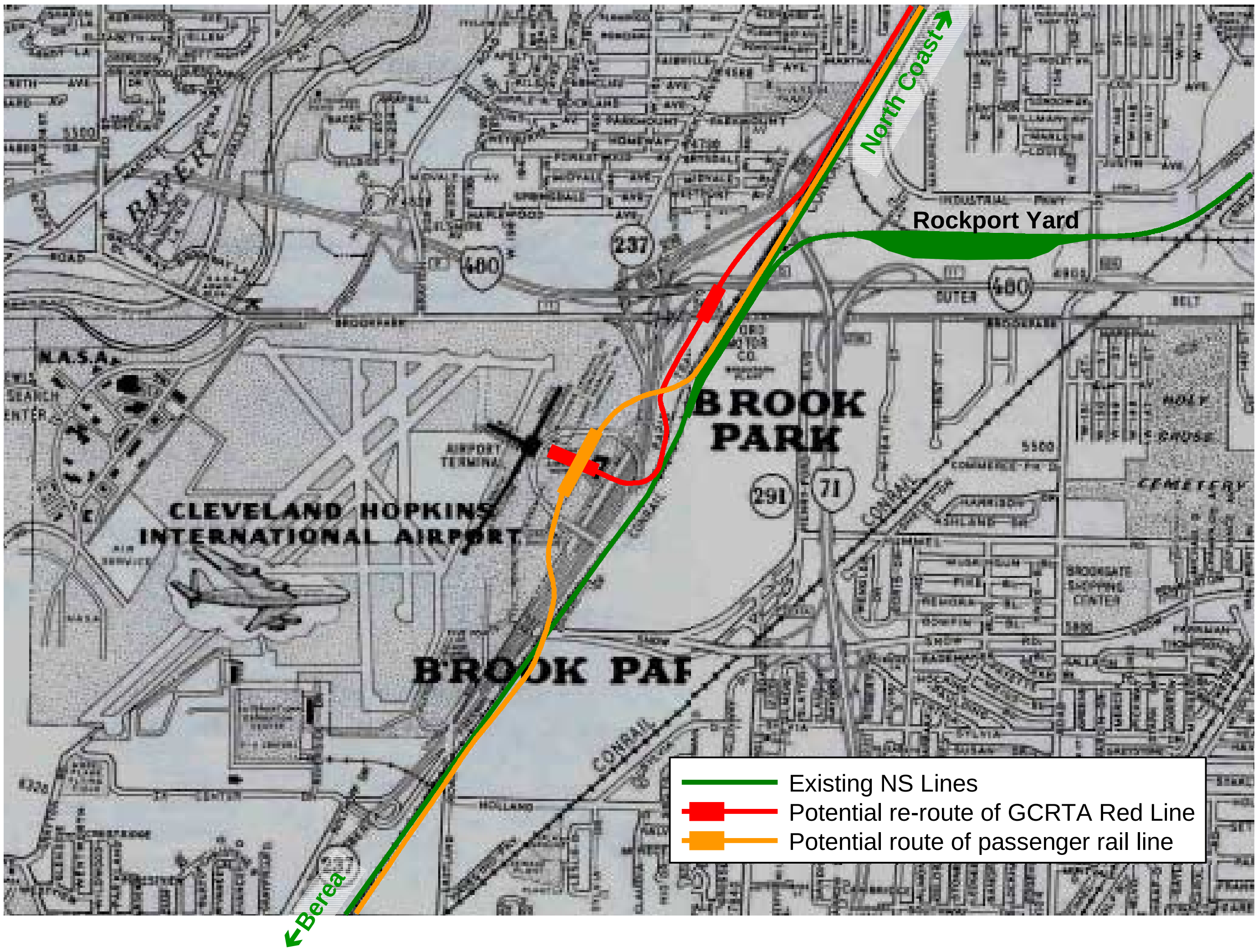
Since the cost of initial implementation at any level of service is high, LOS 3 is the appropriate level of service to analyze for commuter rail in this corridor, if built in tandem with a new Cuyahoga River bridge crossing, the airport station could become the logical termination point (instead of downtown Cleveland) for commuter services from the east and south.

Assumed Configuration in Hopkins Airport Vicinity

In the vicinity of Brook Park, the confluence of multiple rail lines and the interstate highway interchange of I-71, I-480, SR 237 and SR17 creates a bottleneck point where addition of main tracks for passenger rail service is difficult and costly. The freight tracks run directly parallel to the RTA Red Line tracks beneath the interstate highway bridges, with no spare “slots” for additional tracks. Additional tracks, however, are needed for passenger trains through this bottleneck. A proposed concept is shown in Figure 3.3.4.

Figure 3.3.4

Potential Passenger Rail Route via Hopkins International Airport



Shifting the freight tracks is impossible because of the relatively complex trackwork where the Chicago line, Cloggsville branch line, Rockport Yard lead tracks and the yard serving the Ford assembly plant all come together in a major interlocking. Therefore, the proposed concept in this area shifts the Red Line to a new alignment directly north of its existing alignment and at a lower level – tunneling beneath the interstate highway bridge approaches and passing beneath Brook Park Blvd. before rising up to grade level along the west side of the existing RTA yard and then connecting into the existing tunnel to the Hopkins Airport terminal station. The Brook Park Red Line station would be reconstructed and the existing pedestrian underpass beneath the railroad refurbished and extended to serve the new station. Additional parking also could be provided west of the railroad on industrial land that is not now in active use.

The two existing Red Line tracks would be reconstructed as the passenger mainline tracks. West of Brook Park Blvd., the passenger tracks would veer off of the railroad right-of-way and head towards the airport terminal, crossing SR 237 – either on elevated structure or in a depressed section or tunnel. If an elevated structure is used, the elevation of the approaches must remain outside of the Hopkins Airport runway approach clear zone.

Commuter rail service at Level of Service 1 or 2 would require three revenue trainsets (not including spares). Expanding to Level of Service 3 requires a fourth trainset.

Seasonal service to recreational areas at Cedar Point and Sandusky also could be provided along this line, provided negotiated agreement is reached with Norfolk Southern for the operation of such trains.

With the combination of commuter service to Elyria, high-speed passenger service to Chicago and high-speed passenger service in the 3-C corridor, it is assumed that a two-track dedicated passenger railroad will be required from the NCTC in downtown Cleveland to the vicinity of North Ridgeville, including a separate dedicated alignment through Hopkins Airport.

Capacity Opportunities and Constraints

Route 2 has some obstacles to commuter service that may make it more difficult or costly to implement than the Lorain route. Route 2 shares the busy NS Chicago mainline for its entire 29-mile length, from downtown Cleveland to Amherst. The extent to which a third or perhaps fourth main track will be needed, to separate passenger traffic from freight traffic, will be subject to negotiation with Norfolk Southern. NS has expressed opposition to the introduction of commuter trains on this line and may require significant capital investment.

The Cuyahoga River crossing and the Brook Park-Hopkins Airport area are the two principal bottleneck points on this line – both of which require major capital investment to support commuter rail service at LOS 2 or LOS 3.

Major Capital Projects

The downtown Cleveland facilities – the NCTC and E.26th Street Yard, would be the same as for Route 1. The Erie-Nickel Plate connection is considered to be a prerequisite for any service in this corridor that does not include the construction of additional rail capacity across the Cuyahoga River.

Between the Cuyahoga River and Berea, including the segment through Hopkins Airport, significant investment in additional railroad capacity will be required. Between Berea and Elyria, an additional mainline track is assumed to be provided, within the existing right-of-way, which was originally four tracks wide. West of Elyria, addition of a dedicated passenger track will require a new bridge span and addition of a crossing diamond at the crossing of the CSX north-south branch line.

Station Locations

The following station locations along Route 2 have been assumed in this analysis.

Table 3.3.2
Potential Commuter Rail Stations – Route 2 –West Corridor

Station:	**Street location:**	**Transit connections**	**Type**
Cleveland - NCTC		LRT, buses	
Hopkins Airport	Airport Terminal	RTA Red Line	P
Berea	Front St.		T,P
Olmsted Falls	Depot St.		T,P
North Ridgeville	SR 10		P
Elyria	East St.		T,P
Amherst	SR 58 & Ohio Tpke.		P

T=town center; P=park and ride available.

The North Coast Transportation Center is the assumed station location in downtown Cleveland. The Hopkins Airport station is assumed to be located at a new multi-modal facility adjacent to the air passenger terminal, with convenient pedestrian connections to both the RTA Red Line and the air terminal. Should commuter rail in this corridor proceed without or in advance of major redevelopment at the airport, a station could be constructed along the existing rail corridor, where a new passenger track would need to be constructed adjacent to the existing rail line. Pedestrian connections to the airport and Red Line station, in this instance, would be by means of moving walkways, shuttle buses or other on-airport transport system.

The station at Berea would be situated between the NS and CSX main lines, placed in such a way as to not interfere with connecting train movements between the two lines in either direction. Additional tracks would need to be constructed in this area to accommodate a station, and these tracks also would be grade separated at Front Street.

Passenger stations would be located in the village of Olmsted Falls and in North Ridgeville near the SR10 interchange with the Ohio Turnpike. The Elyria station would be located at the historic train station site, on East Street. It is assumed that Amtrak trains stopping at Elyria also would use this station. If commuter service is extended to Amherst, a passenger station could be located at SR58 or at the former passenger station location. The former site may be preferable, since the historic station site is accessible only from local residential streets.

3.3.3 Route 3 – Southwest Corridor, Cleveland – Medina

Physical and Operational Characteristics of the Line
The majority of this route follows the CSX Cleveland branch line, a single-track line with available capacity for commuter trains. The Cleveland end of the route, however, follows the same alignment as Route 2 – between Cleveland and the vicinity of Brook Park and Hopkins Airport, with all the attendant capacity constraints and construction requirements. The Medina end of the route includes approximately three miles of the Wheeling & Lake Erie line approaching Medina from the west (see Figure 3.3.5). Compared with Interstate 71, the obvious highway route, the rail routing from Medina to Cleveland is relatively indirect.

Route 3 from Cleveland to Medina follows the Route 2 alignment along the Norfolk Southern main line to the vicinity of Brook Park or Berea (10-12 miles), and then requires a new track connection to the CSX (former B&O) Line running southwestward from Cleveland. The connection would join the CSX line somewhere between Parma Jct. and the crossing of the Ohio Turnpike. The line then follows the CSX Line to Lester (a total of 12-17 miles, depending upon the location where the connection from NS is made), serving the western portions of Strongsville and Brunswick. The route would turn eastward where it crosses the Wheeling & Lake Erie for the approach to downtown Medina. A shorter route was initially considered, following an abandoned B&O rail spur from Lester into Medina. This alignment, however, is now occupied by a hiker/biker trail and a major water line and is no longer available for rail use.

Three preliminary potential routings were identified for the NS-CSX Connection:

- Rockport alignment
- I-71 alignment
- Fairgrounds alignment

Figure 3.3.6 shows the general alignment of these three preliminary options. All of these routes would entail substantial investment in right-of-way acquisition, grade separation, support structures and new trackwork and signaling.

The full route from Cleveland to Medina would be approximately 35-40 miles long. A trip from Medina to downtown Cleveland typically would take about 50-60 minutes by rail.

Commuter rail service at Level of Service 1 or 2 would require three revenue trainsets (not including spares). Expanding to Level of Service 3 requires a fourth trainset.

Figure 3.3.5
Southwest Corridor
Route 3

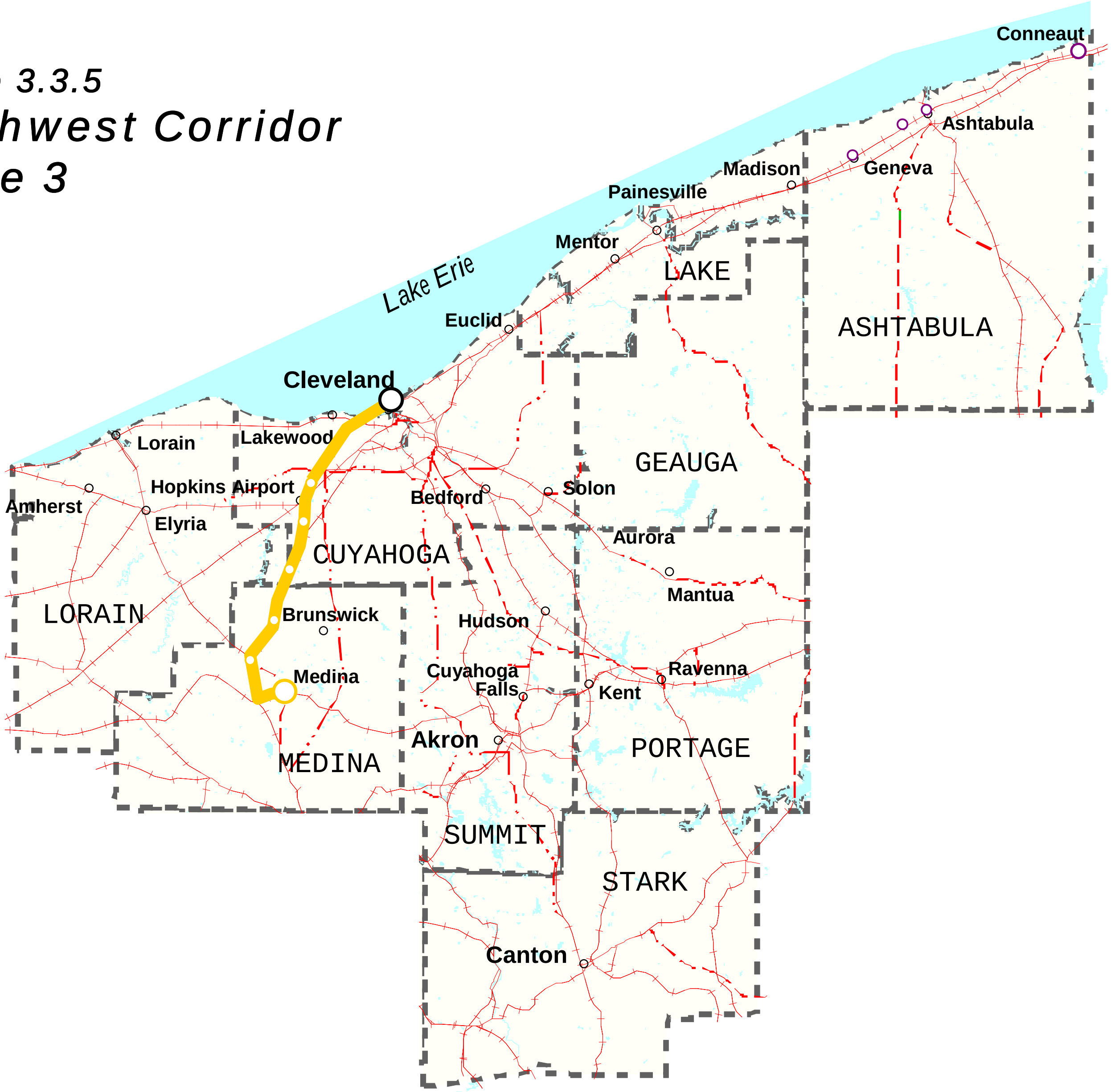
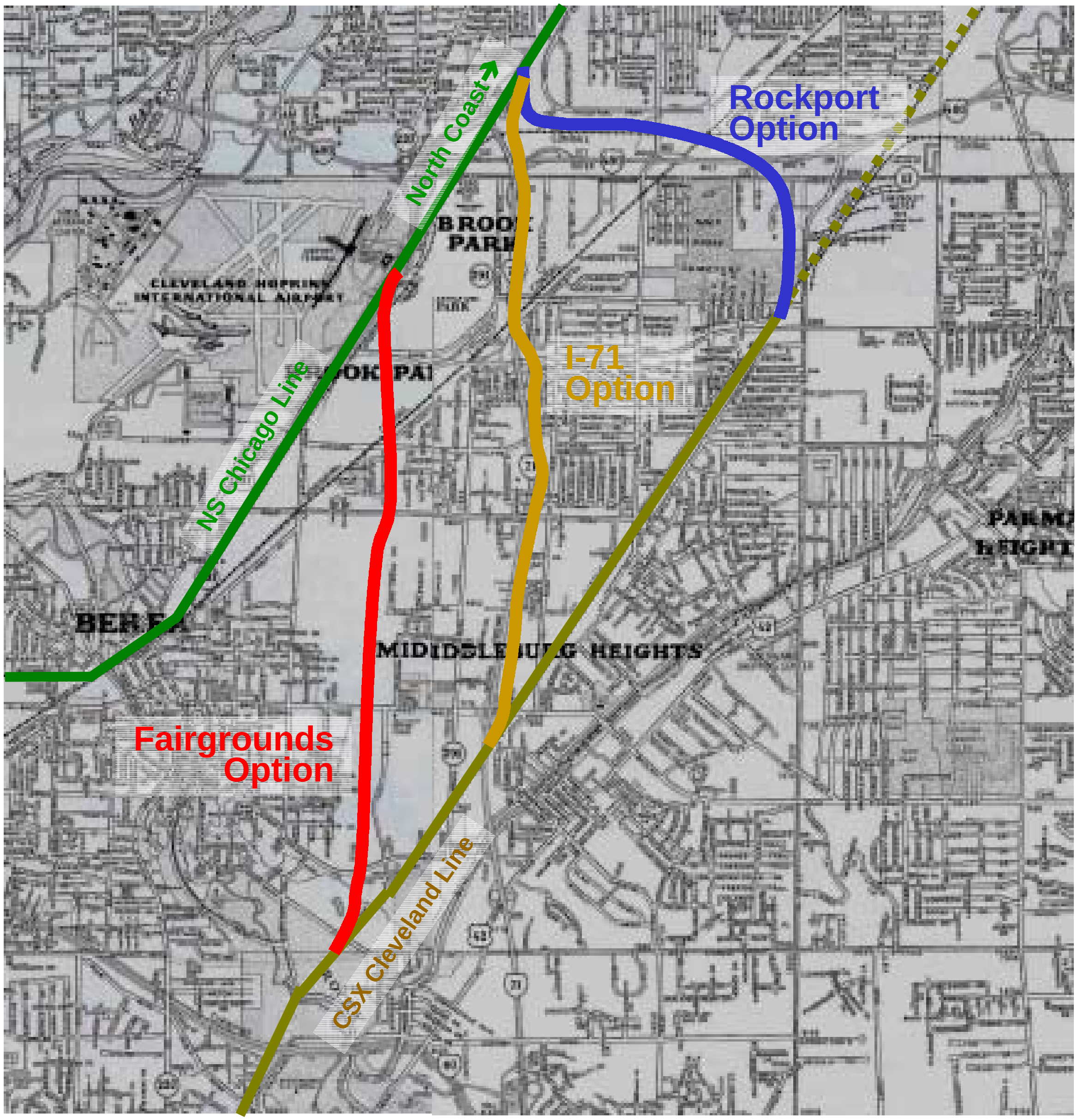


Figure 3.3.6

NS-CSX Connection Alignment Options



Capacity Opportunities and Constraints

The unique characteristic of this route, among all of the potentially feasible routes, is the need for a piece of new rail line most likely on a new right-of-way – to connect the CSX Cleveland Line with the NS Chicago Line in order for commuter trains to be able to reach the North Coast Transportation Center site in Cleveland. This connection will require acquisition of a new right-of-way. Several possible alignments were identified, but a preferred route for the connection was not selected in the first phase of the NEORAIL Study. The relatively high cost of this connection makes this route the least cost-effective of the seven potentially feasible routes. Route 3 also shares with Route 2 the Cuyahoga River capacity constraints and heavy freight traffic between Brook Park and Cleveland.

Major Capital Projects

All of the rail capacity investments for Route 2 between Cleveland and Brook Park also are required for service in the Medina corridor. If this route is implemented as an extension to service on Route 2, the incremental cost still needs to include major investment in a new track connection between the NS Chicago Line and the CSX Cleveland Line. Other significant capital projects in this corridor include:

- passing siding in the vicinity of Liverpool and Brunswick
- signaling of the line to support bi-directional passenger operations
- CSX-W&LE track connection west of Medina
- overnight storage yard in Medina.

Station Locations

The following station locations along Route 3 have been assumed for purposes of ridership estimating and capital costing. Alternate locations for stations along the three potential NS-CSX connection routings are shown.

The I-71 and Rockport routings are shown with a station at West Park, to enable transfers between the commuter rail line and the GCRTA Red Line. For the Fairgrounds routing, this transfer is assumed to occur at Hopkins Airport.

Each of the three potential routing options has a station in the vicinity of Brook Park (Snow Road) and another station in the vicinity of Middleburg Heights (Bagley Road). The Strongsville and Brunswick/Liverpool stations are projected to be located at SR82 and SR303, respectively. The rail line is situated well to the west of the downtown areas of these towns.

The station in Lester is a former passenger station location, at the junction point of the CSX line to Lorain. The Medina station is located on the south edge of downtown, where the W&LE Railroad crosses through town at grade.

Table 3.3.3
Potential Commuter Rail Stations – Route 3 – Southwest Corridor

Station:	**Street location:**	Rockport Rt. I-71 Route Fairgrounds	**Transit connections**	**Type**
Cleveland - NCTC	W.3rd-E.9th Sts.	●●●	LRT, buses	
West Park	RTA Red Line West Park station	●●❍	GCRTA Red Line	
Hopkins Airport	Airport Terminal	❍❍●	GCRTA Red Line	P
Brook Park	Snow Road at I-71	❍●❍		P
Brook Park / Parma	Snow Road at Pearl Road	●❍❍		P
Berea/Fairgrounds	Cuy.Co.Fairgrounds	❍❍●		P
Middleburg Hts.	Bagley Road at I-71	●●❍		P
Strongsville	SR 82	●●●		P
Brunswick / Liverpool	SR 303	●●●		P
Lester	SR 57 / Spieth Rd.	●●●		P
Medina	SR 18 / Washington St.	●●●		T,P

T=town center; P=park and ride available.

3.3.4 Route 4 – South Corridor,
Canton – Akron – Cleveland via Hudson

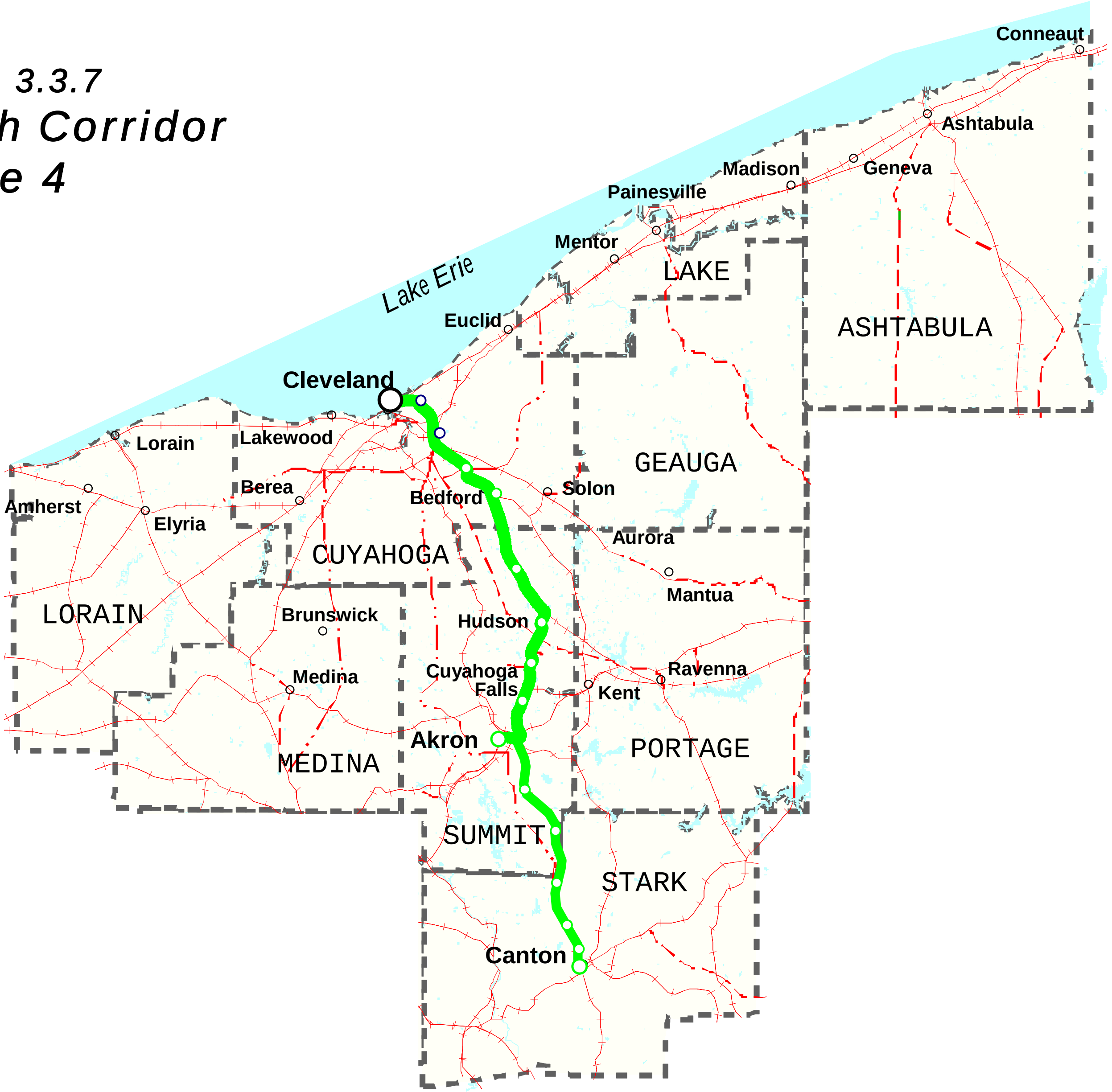
Physical and Operational Characteristics of the Line
This is one of two routes in the NEORail South Corridor (Cleveland-Akron-Canton corridor) that were analyzed and found to be potentially feasible. The two routes are:

- Route 4, Via Hudson on the Norfolk Southern Cleveland Line
- Route 5, Via Kent on the Wheeling & Lake Erie Railroad

A Major Investment Study is underway in this corridor, addressing the same two potential commuter rail routes, plus light rail (in interstate highway corridor), bus service improvements and highway improvements. Both commuter rail routes follow a common alignment between the North Coast station in Cleveland and Bedford – using approximately 13 miles of the Norfolk Southern (former Conrail) Cleveland Line right-of-way. They also share a common alignment at the south end, from Akron to Canton. The two alternative routes follow different alignments between Bedford and Akron, as described below. The Akron station and track configuration approaching Akron also could differ substantially between the two options. Route 5 is described in Section 3.3.5.

Route 4, shown in Figure 3.3.7, serves Cuyahoga Falls, Hudson, Macedonia and other communities between Akron and Cleveland.

Figure 3.3.7
South Corridor
Route 4



Route 4 remains on the Norfolk Southern Cleveland Line for a total of 25 miles, from the North Coast Transportation Center in downtown Cleveland to Hudson. The Cleveland Line is double-track, but an additional track may have to be added along most, if not all, of this route because of the relatively heavy level of freight traffic. At Hudson, the line would diverge onto an abandoned branch line to reach Akron. The Hudson branch line, now owned by Akron Metro RTA, is a single-track right-of-way that starts in Hudson and runs for 12 miles through Cuyahoga Falls to Arlington Street in Akron. The tracks along this branch line would need to be restored.

At Arlington Street, the commuter rail route would have to cross over the busy east-west CSX main line and run parallel to it for approximately one mile to reach the proposed commuter station site at Quaker Square. The crossing could be either at-grade (the least expensive alternative) or grade-separated by means of a commuter track flyover at Arlington Street (which would be more costly but avoid potential scheduling conflicts and delays for passenger and freight trains at this junction point).

This alignment offers the most direct and potentially the fastest route between the Cleveland and Akron downtowns. Speeds up to 79 mph are possible along the NS mainline. The run time from Akron to Cleveland, with intermediate stops, would be slightly under one hour.

The biggest potential drawback with this option is the very heavy level of freight traffic on the Cleveland Line – the Norfolk Southern main line between Cleveland and Pittsburgh – and the presence of a very active rail freight yard in the Macedonia vicinity. “Motor Yard” serves two active automobile plants on either side of the right-of-way. The original mainline right-of-way is only two tracks wide between Bedford and Hudson, with the addition of a third track for commuter trains more costly than elsewhere in the study area where the original railroad was built wider.

To get between Akron and Canton, both South Corridor routes would follow a largely abandoned single-track line recently acquired by Akron Metro RTA, formerly the CSX Sandyville Subdivision. This line generally follows Interstate Route 77, an active and growing development corridor, and passes adjacent to the Akron-Canton Airport and the Pro Football Hall of Fame. The station at Canton could be either in the vicinity of Tuscarawas Street or at the former Amtrak station location at the southern edge of the business district. The route from Akron to Canton is approximately 24 miles long and provides a relatively direct link between the two cities. A trip between Canton and Akron would take between 35 and 40 minutes. A trip between Canton and Cleveland, with an intermediate stop at the Quaker Square Station in Akron, would take approximately100 minutes.

With three revenue trainsets, a Cleveland-focused commuter operation could be supported at LOS 1 (or LOS 2, if the line were to terminate at Cuyahoga Falls). Adding a fourth revenue trainset would enable operations at LOS 2 to Akron. Adding a fifth revenue trainset would enable LOS 3 between Cleveland and Akron or LOS 2 between Cleveland and Canton, via Akron. Full operations over the entire 60-mile route require a total of seven revenue trainsets.

Similar capital investments will be required to support LOS 2 or LOS 3 in this corridor. A new mainline track will need to be constructed alongside the NS mainline between Cleveland and Hudson, the Akron Metro RTA-owned secondary line between Hudson and Akron, and between

Akron and Canton will need to be upgraded for commuter operations, and an alignment and station location in Akron will need to be selected. LOS 3 will require two or more additional commuter passing sidings than LOS 2.

Capacity Opportunities and Constraints
The following locations along Route 4 represent capacity constraints or areas where significant investment will be required to support commuter operations:

South and East Corridors:

- NCTC-E.33rd St.
    - Right-of-way for 3rd main track up grade (adding 4th track requires retaining structures)
    - Reconstruction of bridge
- E.33rd St.-Kinsman Ave.
    - Right-of-way for 3rd main track (former 4-track right-of-way)
    - Repair of existing bridges, retaining walls – could be costly
- Euclid Ave./E.55th St. Station
    - Single-track station at Euclid Ave. relatively easy to construct
    - Double-track station problematic – and more costly
- Kinsman Yard
    - Good opportunity for commuter passing siding & interlocking

South Corridor (CAC):

- Erie Crossing-Harvard
  -Right-of-way, bridges available to create 3rd main track (former 4-track right-of-way)
- Harvard-Bedford
    - Wheeling & Lake Erie right-of-way, parallel and adjacent to NS mainline, available for operation of commuter trains
- Bedford-Northfield, Macedonia-Hudson
    - 3rd main track alongside NS requires substantial civil/structural work, including
        - Tinker's Creek crossing (high existing embankment)
        - Historic roadway bridges (2-track spans)
        - Numerous cuts and fills and stream culverts
- Motor Yard
    - Local switching traffic uses, crosses main tracks
    - Hand-thrown switches at Motor Yard, Chrysler Branch junction
    - 3rd main track, remote-control interlockings to improve operations, add capacity
    - Grade separation of passenger track would be costly

South Corridor (CAC):

- Hudson-Cuyahoga Falls
    - Single-trackright-of-way– passing siding desirable
- Akron area
    - Crossing of CSX main line at Arlington Street – grade separation avoids conflicts but adds significant cost

Major Capital Projects
This route serves several urbanized areas but also has a relatively high estimated implementation cost. The base estimate includes passing sidings and a signal system for bi-directional passenger service (to serve the multiple destination markets in this corridor) as well as increased capacity along the NS Cleveland Line between Cleveland and Hudson. The magnitude of the required investment will be a function of negotiations with Norfolk Southern. An additional main track would be relatively easy to add between the North Coast Transportation Center and Harvard. Between Harvard and Erie Crossing, the single-track Wheeling & Lake Erie parallels the 2-track NS mainline. With additional crossovers and signals added at two locations, this track could effectively serve as a third main track and could be used by passenger trains. Improvements south of that point, where the right-of-way narrows, would be more costly.

Station Locations
Table 3.3.4 lists the station locations along Route 4 that have been assumed for purposes of ridership estimating and capital costing. In addition to the main terminal at the North Coast Transportation Center, there are several potential station locations within the City of Cleveland east of downtown. The East 55th/Euclid station is located at the site of the original Pennsylvania Railroad station. Vestiges of the station platforms and stairways remain in place. Modern platforms, stairways and elevators would be constructed. A bus transfer facility would be built as part of this station, serving buses along the Euclid Avenue corridor as well as local buses along East 55th Street. NEORail passengers destined for the University Circle area would use this station to transfer to Euclid corridor buses.

The East 88th/Union station is located at the point where Routes 4 and 6 diverge, providing the opportunity for rail-to-rail transfers between the two lines, if both are operated. Local bus routes along Union Avenue and Broadway can be adjusted to serve the station and provide good transit connections for reverse commuters from many neighborhoods on the east side of Cleveland. Vehicular access is from Union Avenue. Alternative station locations in the city of Cleveland also were considered and may be candidates for future implementation. These include East 79th Street (transfer to the GCRTA Red Line), Shaker Rapid (transfer to the GCRTA Blue and Green lines) and Kinsman Avenue.

The station at Garfield Heights is assumed to be located with convenient highway access from Interstate 480. At Bedford, the station would be downtown, in the vicinity of the Grace Street grade crossings of the NS and W&LE lines. A potential future station location is indicated in the vicinity of Walton Hills/Northfield Park. The Macedonia station would be located approximately where SR 82 crosses the rail right-of-way. Construction of a third track through this area is assumed, as is modification or reconstruction of the SR 82 underpass to increase vehicular clearances and enable widening of the roadway.

At Hudson, the preferred station location from a railroad operations point-of-view would be on the Hudson-Akron branch line. An alternate site would be on the northern side of downtown, along the NS mainline. A potential station to serve Silver Lake, Stow and Darrowville could be situated in the vicinity of Graham Road. The preferred Cuyahoga Falls station is at Broad Boulevard, at an industrial site that is slated for redevelopment.

There are three alternative station locations in downtown Akron, each of which is described in Section 3.5.2. On the Sandyville line south of Akron, stations are assumed to be located at South Akron (SR 764, Triplett Blvd.), Myersville/Uniontown (SR 619), Akron-Canton Airport, North Canton (Everhard Road and Belden Village) and Canton (Tuscarawas Street).

The actual locations of NEORail stations will require extensive local discussion and analysis and are subject to change prior to implementation of commuter rail service. The CAC major investment study, for instance, is analyzing fewer stations in its initial analysis (omitting the E.88th/Union, Northfield Park, Silver Lake and Myersville/Uniontown stations).

Table 3.3.4
Potential Commuter Rail Stations – Route 4 – South Corridor – Cleveland-Hudson-Akron-Canton

Station:	**Street location:**	**Transit connections**	**Type**
Cleveland - NCTC	W.3rd-E.9th Streets	LRT, buses	
E.55th / Euclid	Euclid Av., E.55th Street	Buses	
E.88th / Union	Union Avenue	Buses, NEORAIL	
Garfield Heights	I-480 / Broadway		P
Bedford	Grace Street		T,P
Northfield Park	Vicinity of Northfield Pk.Racetrack		P
Macedonia	E.Aurora Rd./SR 82		T,P
Hudson	Milford Rd./Hudson Plaza		T,P
Silver Lake	Graham Road		P
Cuyahoga Falls	Broad Boulevard		T,P
Akron, at one of 3 sites: ▪ Quaker Square ▪ N. Main St. ▪ N. Howard St.	 • Broadway/University Av. ▪ N. Main St. (W&LE) ▪ N. Howard St.(CVSR)	 Buses Buses Buses	 T T T
South Akron	SR 764 / Triplett Boulevard		P
Myersville / Uniontown	SR 619 / Edison Street		P
Akron-Canton Airport	Mt. Pleasant Street		P
North Canton	Everhard Rd./Belden Village		P
Football Hall of Fame	Fulton Drive		
Canton	Tuscarawas Street		T,P

T=town center; P=park and ride available.

3.3.5 Route 5 – South Corridor, Canton – Akron – Cleveland via Kent

Physical and Operational Characteristics of the Line

This route provides a more circuitous route between Cleveland and Akron (10 miles and 15 minutes longer than Route 4), using the Wheeling & Lake Erie Railroad between Bedford and Kent, an abandoned line owned by the Akron Metro RTA between Kent and Akron. As with Route 4, this route is being studied as part of an ongoing major investment study of transportation options in the Canton-Akron-Cleveland corridor.

Route 5 serves the City of Kent and, compared to Route 4, serves a slightly different set of suburban communities between Akron and the southern end of Cuyahoga County, as shown in Figure 3.3.8 (Streetsboro, Twinsburg, portions of Aurora and Tallmadge on Route 5, versus Cuyahoga Falls, Hudson and Macedonia on Route 4).

The route would be identical to Route 4 at its northern and southern ends – between Cleveland and Bedford and between Akron and Canton. Route 5 would diverge from Route 4 at Bedford, continuing to follow the Wheeling & Lake Erie line instead of the NS mainline for approximately 20 miles from Bedford to the vicinity of Kent, passing through Glenwillow, Twinsburg and Streetsboro. From Kent to Akron, the route would follow for approximately 10 miles an abandoned rail line (formerly part of the Erie Railroad) that is owned by Akron METRO. This part of the line passes through or adjacent to the communities of Munroe Falls, Tallmadge and Stow.

Route 5 has two alignment variations in the Kent Area, for connecting between the Wheeling & Lake Erie and the Akron Metro RTA line. The lowest-cost option would use the existing track connection southwest of Kent, which is known as “Plum Jct.” Unfortunately, the existing connection is in the southeast quadrant of the crossing – which would require Cleveland-Akron through trains to do a “double-reverse” move to continue proceeding towards Akron. An alternative connection would use a piece of the former Lake Erie & Pittsburgh right-of-way, which crosses the Wheeling near Judson Road and passes within approximately one-half mile of the Summit Port Line at Brady Lake. The dog-leg routing via Brady Lake adds approximately 2.2 miles but would save about nine minutes over the alternative routing due to the elimination of the double-back move. The Brady Lake route is preferable from a service standpoint, using the downtown Kent station location and providing a straight-through move for Cleveland-Akron trains. Both routing alternatives are shown in Figure 3.3.9.

Route 5 takes advantage of the railroad capacity that is available on the Wheeling & Lake Erie Railroad and minimizes the distance over which commuter trains must use the heavily-used NS freight mainline (to only the first six miles heading southward from Cleveland). The route serves Kent, as well as other intermediate points that are less well served by Route 4 via Hudson. The Kent-Akron route would provide a rail link between Kent State University and the University of Akron, which could be used by students from one university taking classes at the other university. This route, as well as Route 4, would also serve Cleveland State University, Case Western Reserve University and other educational institutions in the greater Cleveland area.

Figure 3.3.8

South Corridor
Route 5

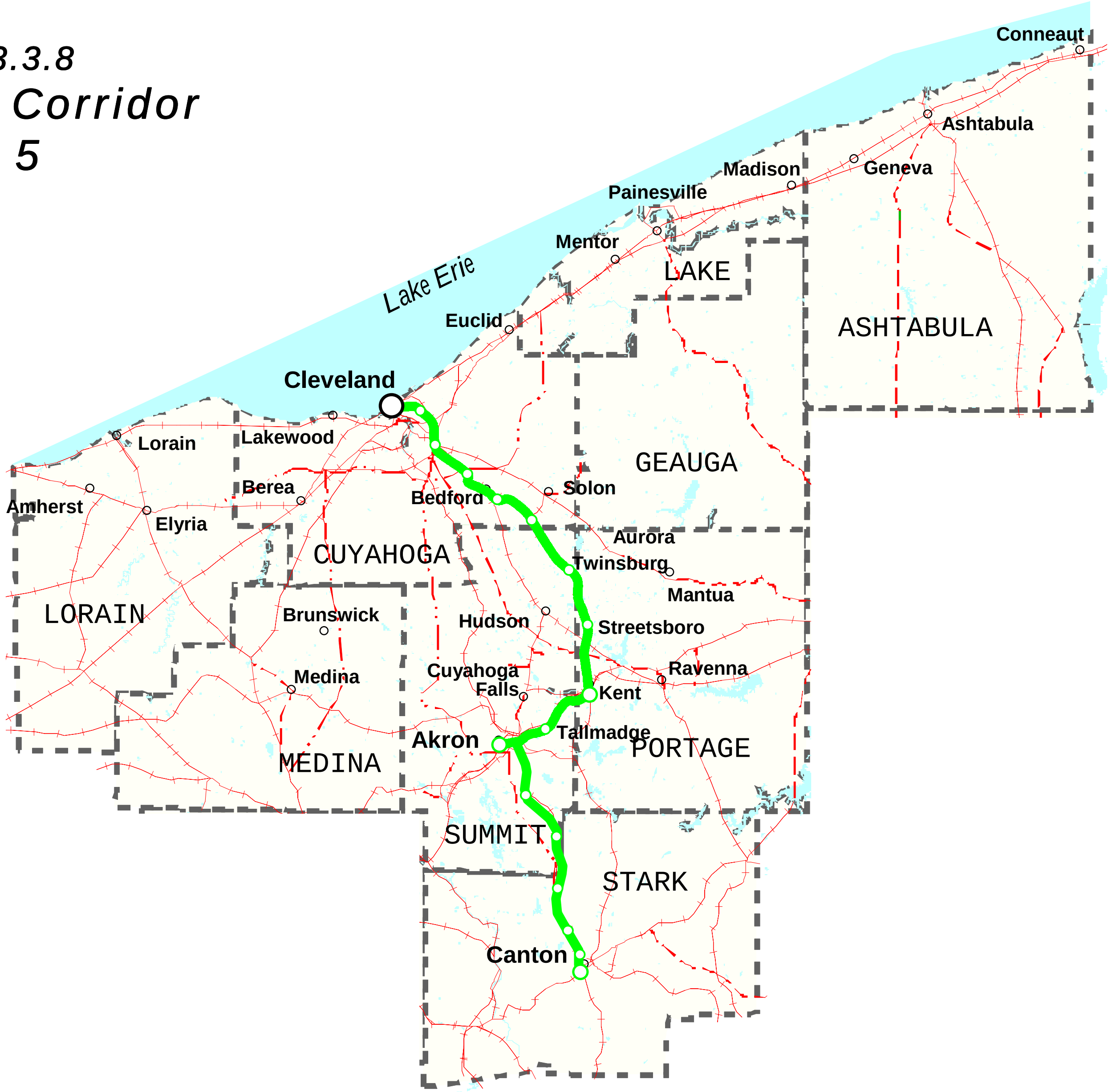
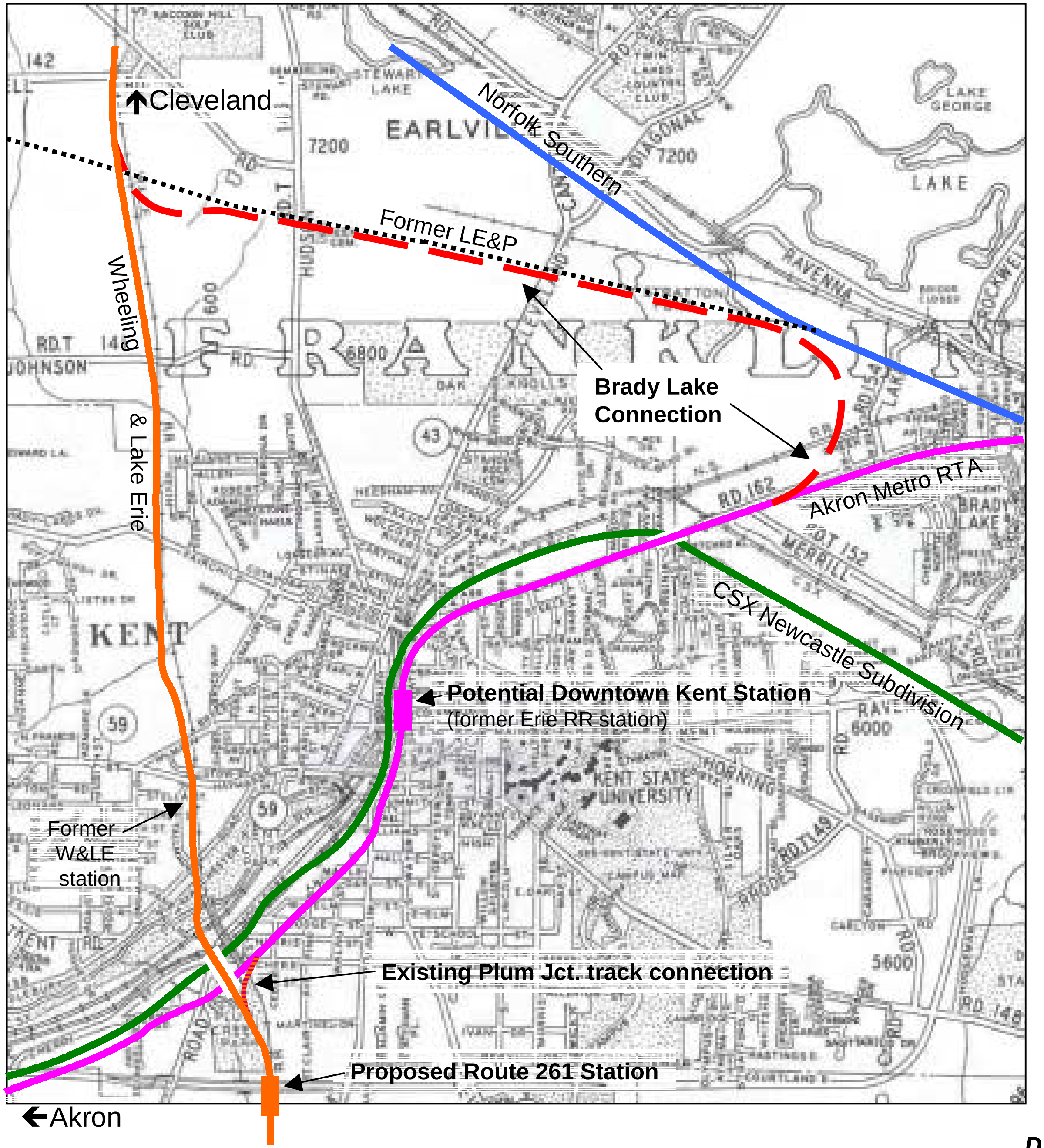


Figure 3.3.9

Route 5 via Kent – Potential Station Sites and Brady Lake Connection



While the Wheeling line carries very little freight traffic compared with the NS main line, the track on the Wheeling route is slow speed and in need of upgrading. Norfolk Southern is generally unsupportive of Route 4 because of potential impacts on their extensive rail freight operations, whereas the Wheeling and Lake Erie views commuter rail as a potential source of revenue and is generally supportive of Route 5, which sees only limited freight traffic.

There are two principal disadvantages of this routing. First, it is approximately 10 miles longer than Route 4 via Hudson. Second, the Wheeling line was originally a narrow gauge (3 feet) line, built relatively inexpensively to a lower standard than the Pennsylvania Railroad's Cleveland Line. It has numerous curves, which reduce allowable speeds to between 35 and 55 mph at eight locations between Bedford and Kent. Improving the speeds at these locations requires realigning the track geometry. Increasing super elevation and adding spirals into and out of curved track sections would allow for a marginal increase in speed. Significant improvements in speed could be achieved by straightening curves at selected locations, but these improvements would be very difficult and costly because of the hilly terrain and the fact that the line is built on the bank of a stream – Tinker's Creek – for much of its length.
Overall, Route 5 adds between 15 and 30 minutes to the total travel time between Akron and Cleveland, as compared to Route 4 via Hudson.

Between Akron and Canton, the alignment of Route 5 is identical to that of Route 4, following the former Sandyville line now owned by Akron METRO RTA. In this alternative, as with Route 4, the multiple-destination travel markets in the corridor favor an operating plan with bi-directional service, which will require investment in passing sidings and signal systems.

Generally, running an equivalent level of service on Route 5 via Kent requires one more revenue trainset than running the same service on Route 5 via Hudson. This is due simply to the longer travel distance.

As with Route 4, the NEORail Phase II study looked at this route in a number of different configurations:

- Cleveland to Kent only
- Cleveland to Akron via Kent
- Cleveland to Akron via Kent, with connecting service to Canton from Akron
- Cleveland to Akron to Canton, via Kent.

A Cleveland-Kent route at LOS 1 or 2 would require three trainsets, similar to the Cleveland-Cuyahoga Falls option for Route 4. However, because of the longer alignment and running time, Route 5 in most cases requires one more revenue trainset than Route 4 to operate the equivalent level of service. Adding two revenue trainsets (for a total of five) would enable LOS 2 between Cleveland and Akron via Kent. A sixth revenue trainset would support either LOS 3 between Cleveland and Akron via Kent, or LOS 2 over the full route, including Akron-Canton. LOS 3 over the full Cleveland-Kent-Akron-Canton alignment would require a total of eight revenue trainsets.

Capacity Opportunities and Constraints

Route 5 is identical to Route 4, from Cleveland to Bedford and from Akron to Canton. Between Bedford and Akron, this route takes advantage of the available capacity on the Wheeling &Lake

Erie and avoids the congested portion of the NS mainline between Bedford and Hudson, including Motor Yard. The only existing siding on the Wheeling line is at Glenwillow. This siding would need to be lengthened and additional sidings constructed to permit bi-directional commuter rail operations to occur. Bi-directional passenger operations also would require installation of a signal system on the line, which is presently unsignaled.

Major Capital Projects

Route 5 would require capital investment in track and signal upgrades on the Wheeling & Lake Erie, plus a siding extension and an improved track connection to the Akron METRO RTA alignment in the Kent vicinity.

Station Locations

The following station locations along Route 5 have been assumed for purposes of ridership estimating and capital costing.

Table 3.3.5
Potential Commuter Rail Stations – Route 5 – South Corridor – Cleveland-Kent-Akron-Canton

Station:	**Street location:**	**Transit connections**	**Type**
Cleveland – NCTC	W.3rd-E.9th Sts.	LRT, buses	
E.55th / Euclid	Euclid Av., E.55th Street	Buses	
E.88th / Union	Union Avenue	Buses, NEORAIL	
Garfield Heights	I-480 / Broadway		P
Bedford	W&LE station (town center)		T,P
Glenwillow	Pettibone Rd.		P
Twinsburg	E.Aurora Rd./SR 82		P
Streetsboro	Mondial Pkwy. (s. of Ohio Tpke.)		P
Kent-South	SR 261		P
Kent-Downtown	E.Main St. & Water St.		T
Tallmadge	Erie St. & Southeast Ave.		T,P
Akron/Quaker Square	Broadway & University Ave.	Buses	T
South Akron	SR 764 / Triplett Boulevard		P
Myersville / Uniontown	SR 619 / Edison Street		P
Akron-Canton Airport	Mt. Pleasant Street		P
North Canton	Everhard Rd./Belden Village		P
Football Hall of Fame	Fulton Drive		
Canton	Tuscarawas Street		T,P

T=town center; P=park and ride available.

The station locations are the same as for Route 4, except for those between Bedford and Akron. On this route, the Bedford station would be at the historic station site on the Wheeling and Lake Erie. At Twinsburg, the station would be located at one of three alternative sites in the vicinity of SR 82. The major east-west highway in Streetsboro is SR 303, but wetlands at the point where the road crosses the railroad may preclude development of a station; an alternate site adjacent to the industrial park along Mondial Parkway is assumed, with good roadway access from both SR 303 and SR 14.

At Kent, there are a number of alternative station sites. The preferred location for a park-and-ride station is at SR 261 south of downtown. Trains using the Plum Jct. connection would stop and reverse direction at this station. An additional station stop could be provided at the former Erie Railroad depot in downtown Kent, along the Akron METRO RTA right-of-way. If the Brady Lake connection were to be implemented, this would be the logical Kent station location.

Between Kent and Akron, along the abandoned former Erie Railroad right-of-way now owned by Akron METRO RTA, the logical intermediate station stop would be at Tallmadge, on the southeast edge of the town center, also serving parts of Stow. At Akron, this route runs directly to the Quaker Square station site with minimal impediments (unlike Route 4). Therefore, this Akron station site is assumed for the Route 5 alternative. Connecting either the former Erie line (from Kent) or the Sandyville line (from Canton) to either the N. Howard St. or N. Main Street station sites would require the construction of track connections that do not now exist.

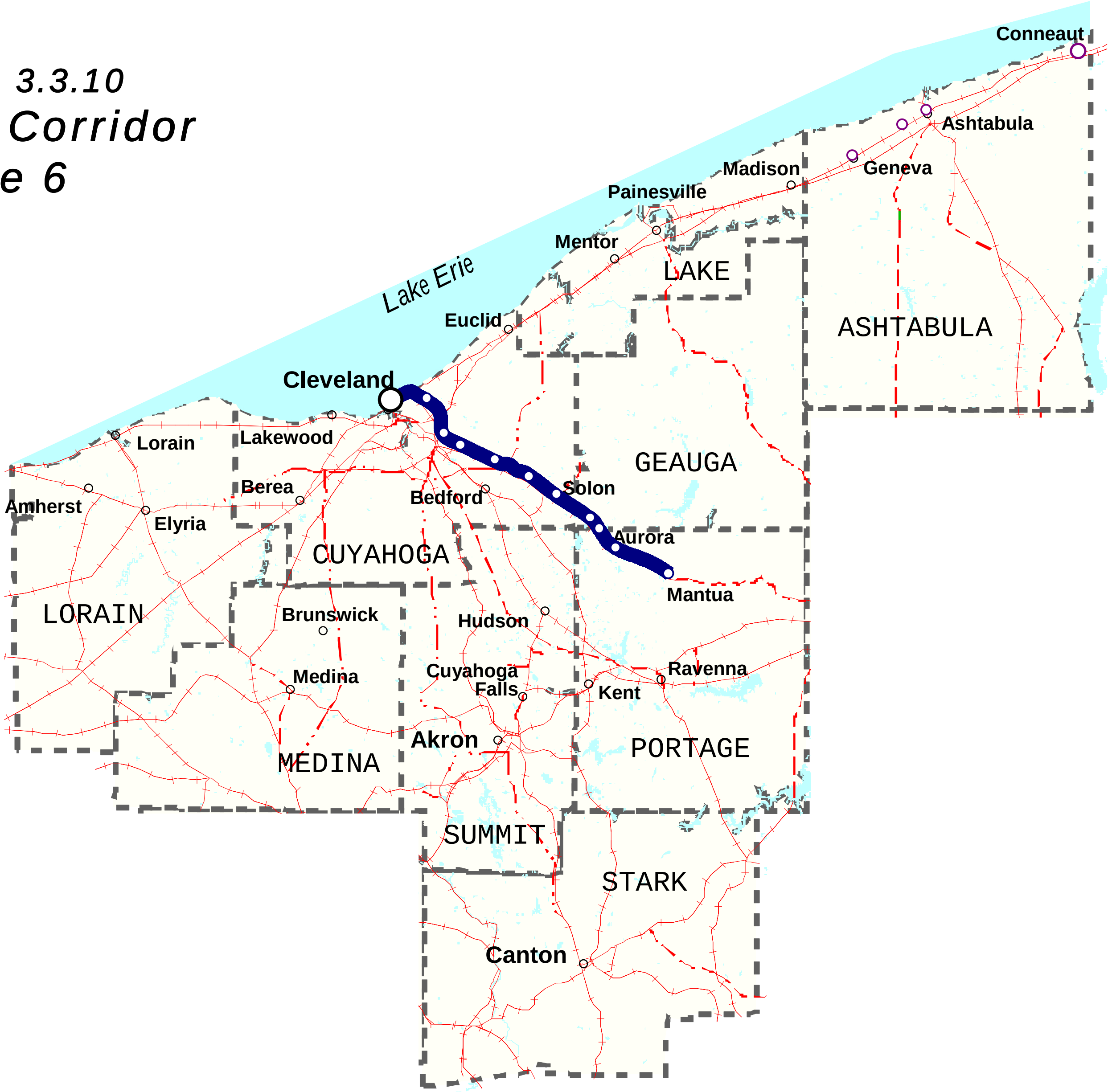
3.3.6 Route 6 –East Corridor, Cleveland – Solon – Aurora – Mantua

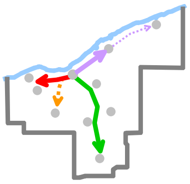
Physical and Operational Characteristics of the Line

Route 6 proceeds in a southeasterly direction from downtown Cleveland to Solon, Aurora and Mantua, serving the intermediate communities of Bainbridge, North Randall, Bedford Heights, Warrensville Heights and Maple Heights, as well as the southeastern portion of the City of Cleveland (see Figure 3.3.10). The line would follow the Norfolk Southern (former Conrail) Cleveland Line for six miles from the North Coast Transportation Center to Erie Crossing, where it would diverge onto the Norfolk Southern (former Conrail) Randall Secondary. The Randall Secondary, originally the Erie Railroad mainline, is now a lightly used branch line that terminates 21 miles east of Erie Crossing, at Chamberlain Road, east of Aurora.

This route follows the same alignment as Routes 4 and 5 from the North Coast Transportation Center for six miles to Erie Crossing. A third track will need to be added in this area to allow adequate separation of commuter and freight trains, as described previously for Route 4. If commuter rail service is ultimately provided in both the Southeast and South corridors (Route 6 and either Route 4 or 5), then a fourth mainline track may have to be added between Cleveland and Erie Crossing. The original Pennsylvania Railroad right-of-way is four tracks wide, and almost all of the railroad bridges remain capable of carrying four tracks, although the two center track slots are currently used. For the introduction of commuter rail service, three tracks are required as a minimum. Whether or not a fourth is required will depend upon the level of service to be operated on each of the commuter lines, and the success of the Erie-Nickel Plate connection project in diverting through freight traffic away from the NS Cleveland line between Erie Crossing and downtown Cleveland.

Figure 3.3.10
East Corridor
Route 6





This route requires a new track connection at Erie Crossing, which would be less expensive to construct than the connection at Alcott Jct. (Route 1), because the two rail lines are at the same elevation. There is ample capacity on this line to accommodate commuter rail service, and implementation of commuter service would be less problematic than it would be on lines where heavy freight activity is present or where expensive new track connections are required.

This route would be easier to implement than other routes that use busy freight corridors. With a third track provided between the North Coast site and Erie Crossing, this route would have almost no impact on any of the heavily-used rail freight lines in the region.

The current track ends at Chamberlain Road, approximately 1½ miles east of Aurora. Potential extension of this line approximately four miles to Mantua, following former Erie ROW, would entail reconstructing track in the former roadbed.

Three revenue trainsets are required to operate service at LOS 1, 2 or 3 to Aurora. Extension of service to Mantua at LOS 2 or LOS 3 requires acquisition of an additional trainset.

Capacity Opportunities and Constraints
On the first six miles of the line between Cleveland and Erie Crossing, the issues are the same as for Route 4. East of Erie Crossing, as far as Aurora, there are no significant obstacles to reintroduction of passenger rail service. In areas with adjoining residential development, noise mitigation measures may be appropriate.

Major Capital Projects
Major required capital investment on this line include:

- 3rd main track, NCTC to Erie Crossing
- Passing siding – Kinsman (E.79th to Union Ave.)
- Passing siding – Harper Rd. to Solon
- Track upgrade, NS Randall Secondary
- Signal system, NS Randall Secondary
- Grade crossing upgrades, NS Randall Secondary
- Stations (see below)
- Overnight storage yard: Aurora (3 trainsets)

The line is short enough that the trainsets could be stored and maintained overnight at the East 26th Street facility in downtown Cleveland. This would save on initial capital costs (avoiding investment in an outlying terminal facility) and add slightly to daily operating costs. The additional non-revenue train movements would not negatively impact freight operations because they would not need to occupy the NS mainline tracks at any time.

If the line is extended to Mantua, an additional passing siding would be required east of Aurora.

Of the seven NEORail corridors, Route 6 to Solon and Aurora is the one that should be easiest to implement, in terms of obtaining approval from Norfolk Southern for the operation of commuter trains over their right-of-way. The first six miles out from Cleveland follow the busy double-track

Cleveland-Pittsburgh main line, where a third track for passenger trains is assumed to be built. With this track in place, addition of commuter trains will have no impact on Norfolk Southern main line operations. The remaining 20 miles of this route follow the NS Randall Secondary, which is now a minor branch line with infrequent freight service. Commuter trains can be operated over this route with no significant impact on freight operations, which can be restricted to nighttime hours. NS is likely to support commuter trains on this line, which could help the profitability of this line for NS, or, alternatively, it may be possible and desirable for the sponsor of NEORail service to purchase the line from NS at a reasonable price.

Phasing – Installation of 6 miles of third main track on the NS line southeastward from Cleveland is a prerequisite for significant commuter rail service. With this improvement in place, plus passing sidings at appropriate locations on the Randall Secondary, it will be possible to operate early-on a high level of service on this line with relatively low incremental costs.

Station Locations

The station locations shown in Table 3.3.6 for Route 6 have been assumed for purposes of ridership estimating and capital costing. The Cleveland, E.55th/Euclid and E.88th/Union stations are at the same locations as on Routes 4 and 5. An additional stop within the City of Cleveland is assumed at East 131st Street, where Miles Avenue crosses the rail line. This location has limited parking potential but provides good local bus access.

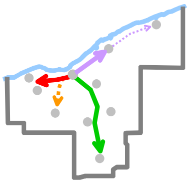
A stop at North Randall, also serving Bedford Heights and Warrensville Heights, would be located west of Northfield Road and south of the Randall Park Mall. This location would have a park-and-ride lot and would be relatively accessible from I-480.

Two stations are proposed within the City of Solon: a park-and-ride station at Harper Road, and a downtown Solon station at SR 91. Two station locations also are assumed at the vicinity of the Six Flags amusement park. A stop near the historic Geauga Lake station site could provide easy walk access to the Six Flags Park. A park-and-ride station at Brewster Road, using a portion of the former Sea World parking lot, could serve commuters from Bainbridge and Aurora as well as patrons of the water park part of the Six Flags complex.

The Aurora station is assumed to be located at the historic station site, along SR 82. Should the line be extended to Mantua, the station would be situated to the west of Main Street (SR 44).

Table 3.3.6
Potential Commuter Rail Stations – Route 6 – East Corridor

Station:	**Street location:**	**Transit connections**	**Type**
Cleveland - NCTC	W.3rd-E.9th Sts.	LRT, buses	
E.55th / Euclid	Euclid Av., E.55th St.	Buses	
E.88th / Union	Union Ave.	Buses, NEORAIL	
E.131st	East 131st Street. & Miles Ave.		T



North Randall	Warrensville Center Road		P
Harper Rd	Harper Road at Aurora Road	Distrib buses	P
Solon	SR 91		T,P
Geauga Lake / Six Flags	At amusement park entrance		Special
Bainbridge / Sea World	Brewster Road		P
Aurora	SR 82		T,P
Mantua	SR 44		P

T=town center; P=park and ride available.

3.3.7 Route 7 – Lake East Corridor, Cleveland – Painesville – Ashtabula – Conneaut

Physical and Operational Characteristics of the Line

Route 7 links downtown Cleveland with Lake and Ashtabula Counties, along the shore of Lake Erie (see Figure 3.3.11). Route 7 follows the CSX mainline, which is double track (on a right-of-way that originally was built with four tracks by the New York Central). The biggest capacity bottleneck on this line is Collinwood Yard, which is a major yard and maintenance facility for CSX. The main line is reconfigured through this area, to provide additional capacity (i.e., a third main track) for commuter trains. The extent to which additional portions of third main track or additional sidings are required will depend upon the outcome of negotiations with CSX.

Extending service beyond Painesville would contribute relatively little incremental ridership and should be considered only if it can be delivered at a small incremental cost.

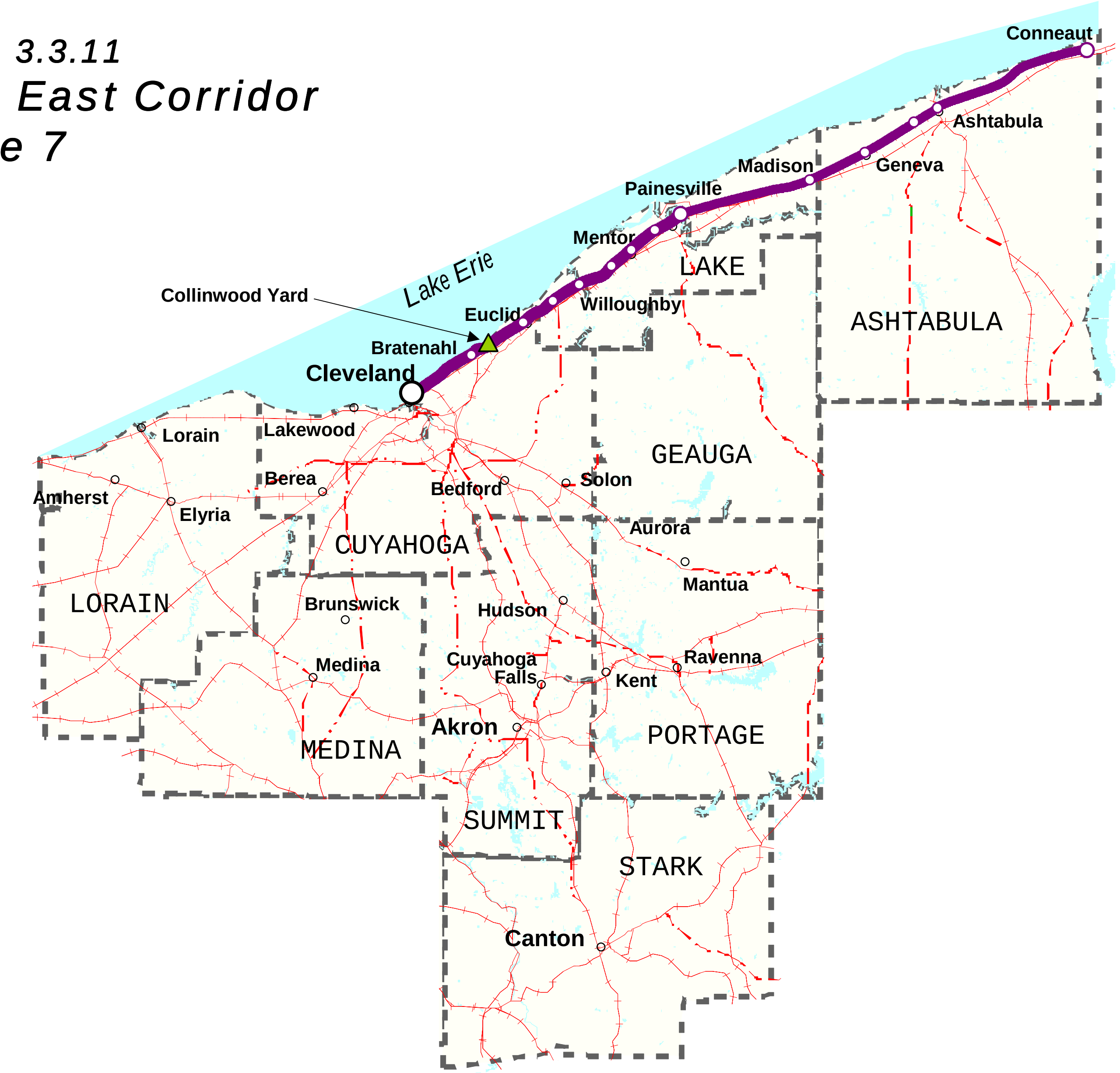
This route parallels Lake Erie to the east of Cleveland using the CSX (former Conrail) Chicago Line. It serves the east side of the City of Cleveland and the communities of Bratenahl, Euclid, Willoughby, Mentor, Painesville, Perry, Madison, Geneva, Ashtabula and Conneaut. The line is one of the longest being considered – stretching a total of 67 miles from Cleveland to Conneaut. However, the density of development drops off considerably east of Painesville – 28 miles out from Cleveland. Travel times to Cleveland would be on the order of 30 minutes from Painesville, 65 minutes from Ashtabula, and 80 minutes from Conneaut.

This corridor has significant ridership demand potential, with well-established communities alongside the rail line and substantial growth in employment in close proximity to the right-of-way, particularly in Lake County. However, the I-90 and State Route 2 highways parallel the rail corridor and have substantial available capacity, which will make attracting a significant share of trips to the railroad a challenge.

The Chicago Line east of Cleveland is double-tracked along its entire length, with additional sidings at Painesville, Perry, Ashtabula and Conneaut. The original New York Central right-of-way is four tracks wide in most places.

Figure 3.3.11

Lake East Corridor Route 7



With the CSX and NS acquisition of Conrail, the first six miles of this route – from the NCTC to Collinwood Yard – are now much less heavily used by freight trains than previously, freeing up capacity for commuter trains. The line east of Collinwood, however, has become CSX's main line from the Midwest to upstate New York and New England. The existing and projected future heavy freight traffic volumes may make the introduction of commuter rail service problematic without investment in at least some additional track capacity.

The NS Nickel Plate Line offers an alternative routing, but this route is not preferred, since the NS line has only a single track, is slated for substantial growth in traffic following the Conrail acquisition, and would require construction of a track connection between the two lines. Should the CSX line become unavailable for use by commuter trains, an alternative routing could use portions of the NS (former Nickel Plate) line, which closely parallels the CSX line through Lake and Ashtabula Counties.

Between Cleveland and Painesville, once a slot for a passenger track is created through Collinwood Yard, the incremental capital cost to increase commuter service from LOS 1 to LOS 3 is relatively small – principally the construction of two intermediate passing sidings. East of Painesville, however, the cost of infrastructure to support more than two or three rush hour trains to Cleveland, and the relatively small size of the projected travel market, make LOS 1 appropriate for this territory. Ashtabula County has limited ridership potential and a peak direction orientation, so LOS 1 is appropriate with minimal investment, contingent upon railroad approval.

Three revenue trainsets would be required for LOS 3 to Painesville (not including spares). Extension of LOS 3 service to Madison would required the acquisition of an additional trainset, as would increasing the number of Ashtabula County trains above two or decreasing peak headways below approximately 35 minutes.

Capacity Opportunities and Constraints

The following locations along the Lake East Corridor (Route 7) represent capacity constraints or areas where significant investment will be required to support commuter operations:

- NCTC-Collinwood
    - Double-track mainline, with limited freight service – no capacity investments required for commuter service
    - Passenger storage yard and maintenance shop at E. 26th St.

- Collinwood Yard:
    - Short Line tracks should be realigned for direct connection
    - CSX has proposed a realignment of the Short Line connection, which would make creation of a dedicated passenger train route through the yard problematic
    - 3rd main track though yard area (south side) for passenger trains – requires shifting of existing tracks and reconfiguration of the westbound diesel locomotive fueling facility and the lead tracks to and from the engine maintenance facility.

- Collinwood and East:
    - Installation of 3rd track relatively easy (formerly 4-track)

- Some bridges would require reconstruction, some shifting of freight mains/sidings may be required for passenger track.

Major Capital Projects

Major projects on this route include:

- E.26th St. Yard & Shop
- 3rd main track, Collinwood to Painesville
- Passing sidings– Wickliffe and Mentor
- Track upgrade and grade crossing upgrades, CSX main line

The third main track between Collinwood and Painesville generally is the trackbed of the former New York Central Railroad, which was a 4-track railroad in this area. At several locations, bridge spans need to be replaced, or bridges widened to make room for an additional mainline track. Overnight train storage and inspection/servicing requirements are assumed to be accommodated at Conneaut for trains originating in Ashtabula County and at the East 26th Street yard facility for trains that start revenue service at Painesville.

Station Locations

The station locations along Route 7 shown in Table 3.3.7 have been assumed for purposes of ridership estimating and capital costing. An East Cleveland / Bratenahl station is provided at East 105th Street, near the existing bus turnaround facility. Limited commuter parking is potentially available with some private property acquisition. In Euclid, a station is assumed along the CSX mainline in the vicinity of the existing mall.

An alternative routing of this line, via University Circle, was identified but not analyzed in detail as part of this study. It would include stops at the East 55th/Euclid station and at University Circle, adjacent to the GCRTA Red Line. The Euclid station along this routing would be at the existing GCRTA bus park-and-ride location.

A station serving Wickliffe and Willowick is assumed at East 305th Street. A station near downtown Willoughby also would serve portions of Eastlake. Two candidate stations in Mentor are provided: one on the west side of town at SR 306 and another serving central Mentor at SR 615. Two stations also are provided in Painesville. A West Painesville park-and-ride station could be situated along SR 44, as part of proposed new development in this area. Downtown Painesville would be served by a station at this historic rail station site.

The stations at Madison and Geneva are located in town centers, but in areas with reasonably good highway access and parking potential. As at Painesville, two stations are indicated in Ashtabula – a West Ashtabula park-and-ride facility at SR45, and a downtown Ashtabula location at the historic station site, with more limited vehicular access. The Conneaut station is assumed to be at the historic downtown station site.

Table 3.3.7
Potential Commuter Rail Stations – Route 7 – Lake East Corridor

Station:	Street location:	Transit connections	Type
Cleveland - NCTC	W.3rd-E.9th Sts.	LRT, buses	
E.Cleveland/Bratenahl	E.105th St.	Buses	P
Euclid	E.260th St.		P
West End (Wickliffe, Willowick)	E.305th St./Rush Rd.		P
Willoughby / Eastlake	Depot St.		P
W.Mentor / Willoughby	SR 306		P
Mentor	SR 615		P
W. Painesville	SR 44		P
Painesville	State St.		T,P
Madison	SR 528/Lake St.		T,P
Geneva	Broadway		T,P
W. Ashtabula	SR 45		P
Ashtabula	Station Ave./Lake Ave.		T,P
Conneaut	Mill St.		T,P

T=town center; P=park and ride available.

3.4 ACCESS TO DOWNTOWN CLEVELAND

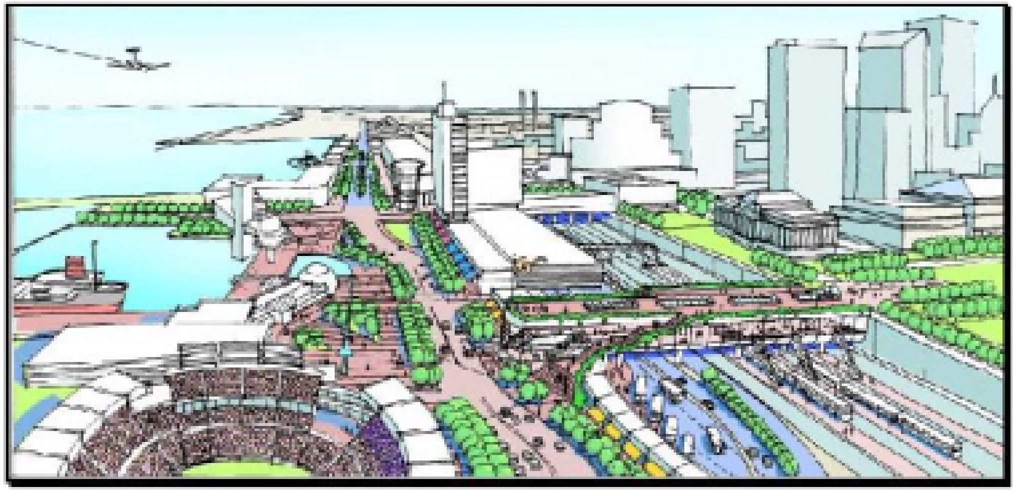
3.4.1 Intermodal Transportation Hub

The downtown Cleveland station for commuter rail is assumed to be the North Coast Transportation Center (NCTC), located between West 3rd and East 9th Streets along the lakefront. The NCTC location, the subject of a separate Intermodal Hub Study, was identified as the preferred passenger rail terminus in Cleveland and the NEORAIL Study assumes this location for all of the potential commuter rail routes that serve Cleveland.

The Intermodal Hub Study followed up on RTA's 1992 study, and examined the need for a site to be identified for multimodal use. RTA had included commuter rail in their long-range plan and a site needed to be identified that would accommodate Cleveland area travel markets, and the economic development in the area. There were several different locations identified as being potentially feasible, including West Third Street Station, North Coast Transportation Center below Mall C, Tower City, East 12th St. on the Lakefront, West 150th Street, and in the area of Cleveland Hopkins International Airport. Tower City was originally identified as the preferred location after the 1992 study, but since that study it has been determined not to be the best location, due to the opposition of the owner of the site and the construction of a new courthouse tower on a portion of the right-of-way.

North Coast Transportation Center below Mall C was selected as the most feasible location, because it would provide access to RTA's Waterfront Line, Amtrak services, buses/street transportation, Cleveland businesses, and various Lakefront attractions, including the Rock and Roll Hall of Fame, the Science Center, and the Browns Stadium. Other sites were determined to be constrained by the size of the site, adjacent roads and property, and new construction in these locations may interfere with existing traffic.

Figure 3.4.1
North Coast Transportation Center Concept



3.4.2 Cleveland Storage and Maintenance Facility

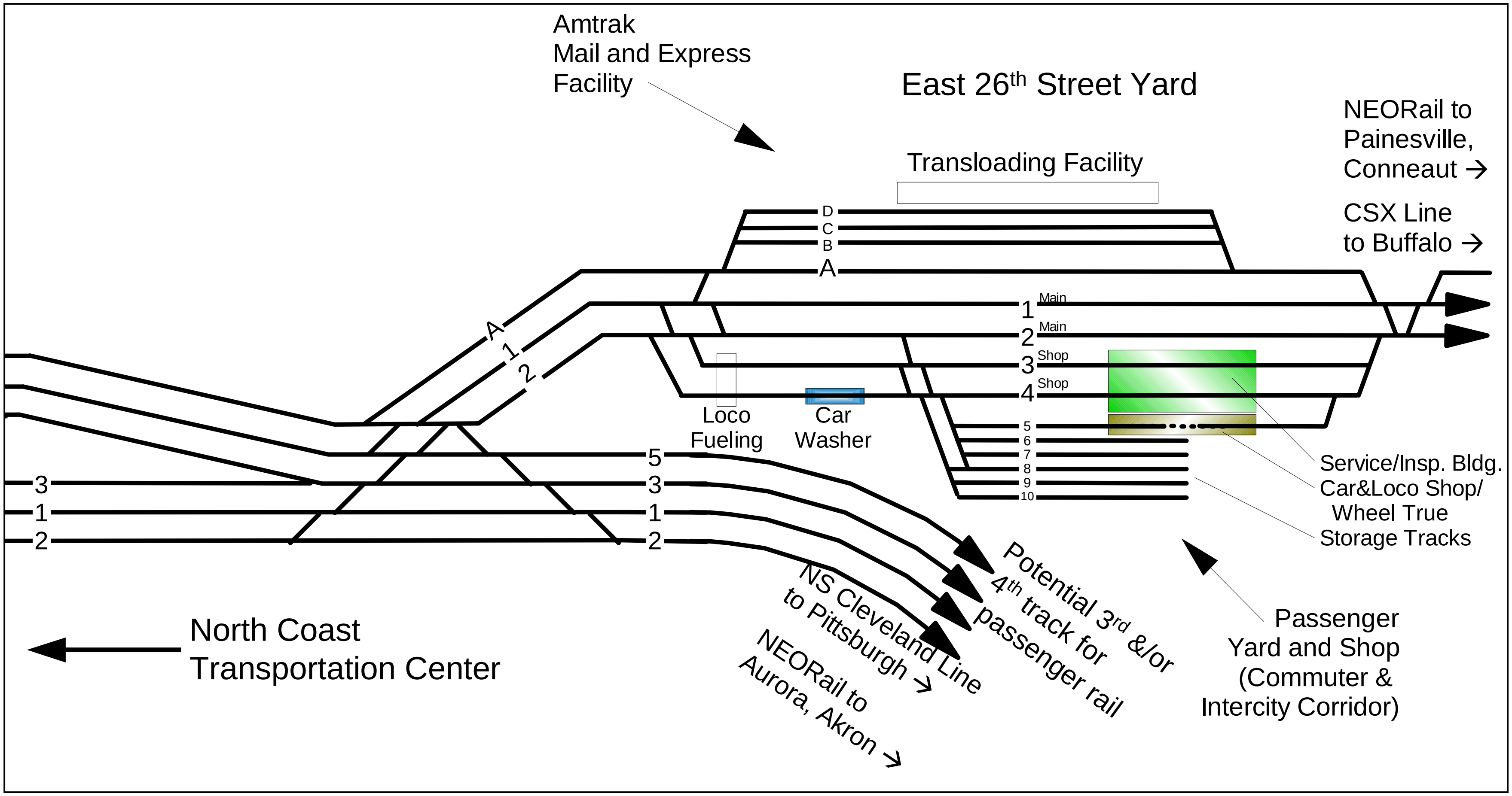
With all of the NEORail Phase II corridors serving downtown Cleveland, the most logical place for a consolidated maintenance facility is close to the North Coast Transportation Center. There are few vacant or potentially available parcels of land situated next to the railroad right-of-way, near the NCTC and with sufficient acreage to support a yard and shop facility. The only site that meets these requirements is the former East 26th Street Yard alongside the CSX tracks heading eastward towards Collinwood.

A possible configuration for a commuter rail storage and maintenance facility at East 26th Street is shown in Figure 3.4.2. The facility is expected to include the following types of facilities:

- Storage tracks for NEORail trainsets
- Welfare facilities (e.g., locker rooms, lunchroom) for train crews and maintenance crews reporting to East 26th Street
- Train service and inspection facility (shed with pit track, one train length long), for performing required inspections, routine and preventive maintenance, and minor repairs
- Car wash
- Locomotive fueling facility (fuel rack)
- Wheel true machine
- Utilities, including electrical power (480v), potable water supply, site lighting and sewerage
- Automobile/truck access and parking.

Figure 3.4.2

East 26th Street Yard Potential Configuration



The 26th Street Yard is part of the assumed system considered in NEORail II costs and operations planning. It is expected that this facility would be constructed in stages, as the commuter rail network grows. Should implementation proceed on high-speed corridor service to Chicago and/or in the 3-C corridor, it would make sense for this service to us the same maintenance facility as NEORail.

3.4.3 Erie-Nickel Plate Connection

Overview

The purpose of this capital project is to provide an alternate route through Cleveland for NS mainline trains, to create capacity for additional passenger trains on the lakefront route. It is the only significant capital project proposed by the NEORail Study that is not proposed for use directly by passenger trains. The project would create a double-track through route for NS trains from Erie Crossing on the east side of Cleveland, on the NS Cleveland-Pittsburgh mainline, to the NS-owned Nickel Plate bridge over the Cuyahoga River on the south side of downtown Cleveland. This new line would connect with the Nickel Plate Line and with a new double-track mainline that NS has constructed from Cloggsville, on the west bank of the Cuyahoga River, to Brook Park, where the line re-joins the NS Cleveland-Chicago mainline (see Figure 3.4.3)

As planned, this route would have a maximum one percent grade over a 3,000-foot distance, slightly higher than the maximum grade along the lakefront route. This route, however, would entail less of a vertical rise for freight trains than the lakefront route, where the bridge over the river is approximately 50 feet lower.

This project would benefit all of the potential NEORail routes by diverting freight trains away from the lakefront, including all routes operating across the Cuyahoga River west of the NCTC (1, 2, 3), and all routes operating between the NCTC and Erie Crossing (4,5 and 6). It also would benefit the potential future high-speed intercity passenger service to Columbus, Cincinnati, Toledo and Chicago.

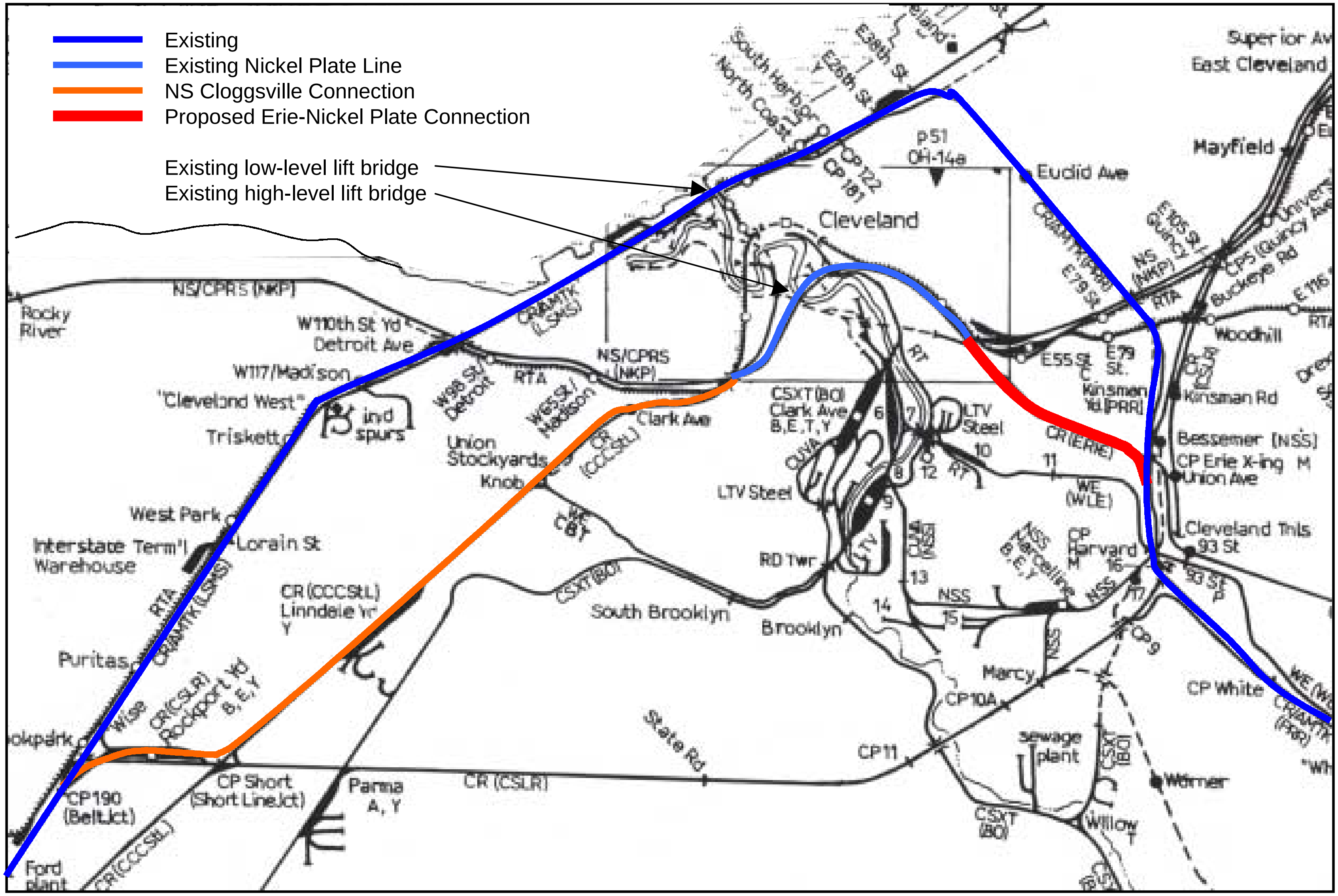
Elements of construction:

The following major items of work are required:

- Reconstruct interlocking on NS Nickel Plate Line
- New railroad grade connecting Nickel Plate and Erie (Randall Secondary) lines east of E.34th Street
- Install track on former Erie-CUT connection alignment across Nickel Plate bridge
- Upgrade Erie line (Randall Secondary) to Class IV track with signals and centralized traffic control (CTC), from Nickel Plate connection to Erie Crossing
- Modify track curvature for higher speed on connecting tracks at Erie Crossing
- New interlocking with NS Cleveland-Pittsburgh main line in Harvard vicinity

Figure 3.4.3

Alternative NS Route through Cleveland via Erie-Nickel Plate Connection



Railroad grades:
One reason cited by NS and others for not advancing this project at the time of the Conrail break-up is the grade of the connection between the two lines at E.37th Street. Topographic base mapping of the area was obtained at a scale of 1”=200’, with two-foot contours. The grade of the alignment that uses the existing Erie-CUT bridge is approximately 1.3 percent – between the controlling vertical constraints of the rail bridge over NS and the underside of the E.34th Street overpass. This contrasts with the current grades on the NS mainline, which reach a maximum of 0.91 percent west of the Cuyahoga River and 0.78 percent east of the river.

However, if a new grade is created on the southern side of both the Nickel Plate and Erie rights-of-way, a longer distance is available to make the vertical transition, and the maximum grade can be limited to 1.0 percent or less. Covering a distance of only 3,000 feet, this grade is not significantly different from the existing mainline grade and is likely to be acceptable to NS, considering that the total vertical rise of the railroad from the Cuyahoga River to Erie Crossing is approximately 50 feet less than via the lakeshore route.

Operations:
At a minimum, the Erie-Nickel Plate connection could be used by westbound NS through trains, where the 1.0 percent grade should not be an issue. Should the capacity and energy savings to NS be great enough, and if there is sufficient capacity to combine the majority of trains on both the Chicago-Pittsburgh and Chicago-Buffalo routes over the Nickel Plate bridge, then this route could become the preferred mainline route for NS trains through Cleveland. The existing line stretching eastward from the NCTC to Erie Crossing and westward to Brook Park and Hopkins Airport would then become primarily a reliever route for NS, while also continuing to serve port-related and local customer traffic. This could conceivably reduce the required magnitude of investment – and possibly delay the need for that investment – in additional passenger-train capacity along this route, including a fourth mainline track and associated bridge reconstruction and potential right-of-way acquisition. However, the lakeshore route will still be required for a significant share of the NS traffic as well as occasional CSX traffic.

Advantages of the Erie-Nickel Plate Connection, and potential drawbacks or obstacles to its implementation, include the following:

Advantages:

- Fuel savings (saves vertical rise of approximately 50 ft. for through trains)
- Capacity (double-track line at higher level and further upstream than lakefront bridge – resulting in fewer bridge openings)
- Both ends of Rockport Yard directly accessible from main line
- Increased separation of freight and passenger traffic

Disadvantages

- Capacity of two-track bridge must be shared between NS Buffalo and Pittsburgh routes

Assumptions to Guide Future Planning
The NEORail study has concluded that there are considerable potential benefits to freight and passenger rail in the Northeast Ohio region associated with implementing the Erie-Nickel Plate

Connection. These benefits will accrue to the freight railroads, freight shippers, passenger rail operators and travelers in the region. If successful, the project will improve the flow of freight trains through Cleveland and free up capacity along the lakefront to introduce commuter rail and potentially high-speed intercity passenger rail service. Without detailed operations analysis, the NEORail Study has estimated that up to one half of the through freight trains at the lakefront could potentially be diverted to the Erie-Nickel Plate Connection route.

The connection project has not been a high enough priority for Norfolk Southern to implement it on its own. However, the public sector cannot implement the project without the approval of NS. Additional technical analyses will be necessary to demonstrate the physical and operational viability and quantify the benefits of the project for NS. Engineering studies will need to be done to determine the minimum grade that will be required at the connection and the curvature and allowable speed for trains operating over the connection. The design of the track connections and railroad configurations at the two new junction points also will need to be further developed and the estimated capital costs refined. Operational analyses, including simulations, will need to be performed to determine the relative running times for typical trains operating over the Connection route, as compared to the existing route, and to determine more precisely the number of trains that can reasonably be diverted from the lakeshore route to the Connection route.

Given the potential freight-related benefits of the project, it may be desirable to progress implementation of the Erie-Nickel Plate Connection in advance of and separate from decision-making and implementation of NEORail commuter rail service in the region.

3.4.4 Cuyahoga River Crossing at Cleveland Lakefront

Capacity Expansion Options and Opportunities

Expansion of rail capacity across the Cuyahoga River at the Cleveland lakefront may be required to support significant increases in the volume of passenger rail traffic to the west of Cleveland, including commuter rail, intercity high-speed rail and Amtrak service. A review of existing conditions, projected future changes and planned improvements and capital projects in the area of the Cuyahoga River at the Cleveland lakefront was carried out, at the direction of the NEORail Commuter Rail Advisory Committee (CRAC). The effort was undertaken to better understand the possible synergies of combining investment in rail capacity with investment to address other transportation needs in the same geographic area.

Future railroad system requirements were identified, and other potential markets for new cross-river transportation capacity also were identified. Available information on existing bridge openings was compiled, along with information on the characteristics of vessels using the Cuyahoga River.

Alternative bridge and approach configurations were developed, and general order-of-magnitude estimates of implementation cost were prepared. In the context of the overall NEORail Phase II Study recommendations, specific assumptions concerning the extent and timing of investment in new Cuyahoga River crossing capacity were developed. A listing was prepared of outstanding technical and policy issues, to be resolved in the future prior to decision-making,

Existing Conditions

The original railroad crossing of the Cuyahoga River at the Cleveland lakefront was a single-track swing bridge, built in 1890. The New York Central Railroad subsequently built the Short Line as a bypass route around downtown Cleveland, temporarily relieving some of the pressure on the single-track crossing. The existing 2-track lift bridge was built in 1957. Conrail was formed in the mid-1970s to take over the routes and services of the bankrupt eastern U.S. railroads, which included the New York Central, Pennsylvania Railroad and Erie-Lackawanna Railroad, all of which had served Cleveland. In 1999, Conrail was acquired by Norfolk Southern (NS) and CSX Transportation. The Cuyahoga River lift bridge is now owned by NS and is part of the NS east-west main line between Pittsburgh and Chicago. Both CSX and Amtrak have operating rights across the bridge, and the bridge is used by the trains of all three railroads.

Rail traffic has grown to the point where the existing bridge has become a significant bottleneck for east-west rail traffic through Cleveland. The railroad right-of-way widens on either side of the bridge – with three tracks running westward towards Hopkins Airport and Berea, and five tracks heading eastward (two towards Pittsburgh on the Norfolk Southern line and three towards Buffalo on the CSX line). In addition, the bottom of the bridge deck structure is only 7-8 feet above the Cuyahoga River water line, so the lift span is raised approximately 8,000 times per year[*] to permit vessels to pass underneath. The railroad is closed to through-traffic while the bridge is lifted. The duration of a bridge lift varies, from under a minute for small pleasure craft to several minutes for large cargo vessels serving the steel and other industries along the River. Further complicating railroad operations and limiting the capacity of the bridge crossing is the track connection to the Port of Cleveland bulk facility at Whiskey Island, which connects to the main line directly west of the bridge. All trains moving to-or-from Whiskey Island, therefore, occupy Track 2 on the bridge.

Typical daily traffic across the bridge is 35-40 trains, including six Amtrak passenger trains. The plan prepared by NS and CSX for the acquisition of Conrail showed 52 planned daily trains crossing the bridge (a combination of NS, CSX & Amtrak services). NS is unlikely to grant access across the bridge for substantial numbers of additional passenger trains.

The existing bridge is a span drive vertical lift span. The bridge provides for 7 - 8 feet of vertical clearance above the water when closed. It provides 98 feet of clearance above the water when fully open. The bridge is 250 feet long, spanning the full width of the river channel.

Potential Markets for Transportation Capacity Across the River

There are several potential uses for new transportation capacity across the Cuyahoga River at the Cleveland lakefront:

- Rail
    - Commuter rail (e.g., NEORail routes)
    - Intercity high-speed corridors, including the Midwest Regional Rail Initiative (MWRRI) with potential service to Toledo and Chicago, and the 3-C Corridor with potential service to Columbus and Cincinnati

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[*] Source: U.S. Coast Guard.

  - Rail freight – through-traffic for both NS and CSX
  - Port of Cleveland – railroad access, especially to the bulk facility at the Whiskey Island terminal
  - Amtrak (through-trains and staging for mail/express traffic)

- Roadway
  - Port of Cleveland – truck access between the Whiskey Island terminal and the interstate highway network
- Flats West Bank – Truck access to-and-from the interstate highway network
  - Other vehicles – emergency, entertainment center patrons, etc.

- Bikeway / greenway
  - Lakefront bikeway – missing link along waterfront
  - Cuyahoga Valley towpath trail

Whereas the construction of a new bridge to serve only one or a couple of these markets might be difficult to justify, given the relatively high cost, a combined project to serve all of the above constituencies might have a better chance of acquiring needed public and political support, as well as funding.

Crossing Capacity Requirements

The desired long-range railroad configuration includes four mainline tracks across the Cuyahoga River – two for freight trains and two for passenger trains, permitting independent bi-directional freight and passenger operations. The separation of freight and passenger traffic would extend westward at least as far as Berea and eastward through the North Coast Transportation Center site. The new rail bridge would have 2, 3 or 4 tracks, depending upon the disposition of the existing bridge and the viability of the proposed Erie-Nickel Plate Connection as a diversion route for NS trains through Cleveland.

Rail access will need to be maintained to the Whiskey Island facility west of the river, and to the Port of Cleveland facilities on the east bank of the river.

The assumed roadway configuration consists of two travel lanes with shoulders. A 2-lane bikeway and footpath also are assumed to be provided, adjacent to the roadway lanes.

Bridge Opening Statistics and Vessel Characteristics

According to information obtained from the U.S. Coast Guard, the lift bridge opens approximately 8,000 times annually. However, the frequency of bridge openings varies seasonally. During the first quarter of the year (January through March), there are only about four to six openings per day. However, during the rest of the year, the typical average is between 30 and 40 openings per day.

The following table (3.4.1) presents the mix of vessels contributing to the bridge openings. They involve a combination of three types of vessels: large lake vessels serving the steel mills and industries up-river, excursion passenger boats that make regular trips from the flats area out onto the lake, and other pleasure boats of various types and sizes. The first two categories of vessels require relatively large vertical clearances, and the reconstruction of bridge approaches and a fixed rail bridge at a high enough elevation to clear these vessels would be prohibitively costly. The pleasure craft, however, include many vessels (other than high-masted sailboats) that could pass beneath a bridge span that provided a relatively small increase in vertical clearance.

Table 3.4.1
Bridge Openings by Vessel Group

Port-related lifts (laker ships)	2,000 annual lifts
Excursion boats *[Goodtimes II, Nautica Queen & Holiday at*	3,000 annual lifts *1,800 vessel round trips]*
Pleasure boats (sail & power)	3,000 annual lifts
Total	8,000 annual lifts

Technology

The preferred solution for maintaining reliable railroad operations would be to replace the movable bridge with a fixed bridge set at a high enough level to permit all vessels to clear underneath. In this case, due to the presence of high-masted sailboats and the large cargo and passenger boats operating on the Cuyahoga River, construction of a high-level fixed span would be impractical due to the long approach grades that would be required to achieve the required height. A tunnel also would be infeasible due to excessive required grades. In this case, the east and west approaches to the lakefront bridge are on downward grades that already approach one percent, the practical maximum for mainline freight service. Any practical tunnel configuration would push the required grades above this threshold.

As a result, movable bridge technology is considered to be the most appropriate technology to continue to apply at this site. Given site constraints such as adjacent commercial and entertainment development immediately to the south of the existing bridge and potential development of port-related facilities to the north, and the continued use of lift bridge technology appears to be the most practical. A new lift bridge or lift bridges could be set at a higher elevation than the existing bridge, to reduce the number of required openings. It also would be feasible to modify the existing bridge structure and lift mechanism to increase the base height of the existing span, if desired.

Effect of Base Elevation Changes

Increasing the base height of the bridge deck would reduce the number of bridge openings, with higher bridge elevations having a greater effect on the number of bridge lifts, as shown in the following table:

Increasing base height of bridge deck by …	..could reduce pleasure craft openings by …	..resulting in a reduction in annual bridge lifts to …
10 ft.	60-70%	6,000
15 ft.	70-80%	5,700
20 ft.	80-85%	5,500

Port-related and excursion boat trips would account for the majority of remaining bridge lifts.

Configuration

The existing bridge could be replaced with a new bridge with a single wide span serving all users, or the ultimate configuration could be a series of independent lift spans. The multiple span concept offers both operational flexibility and redundancy. Based on experience elsewhere, the incremental operations and maintenance costs associated with a multiple span will not be significant. The spans would be controlled and operated from a single location.

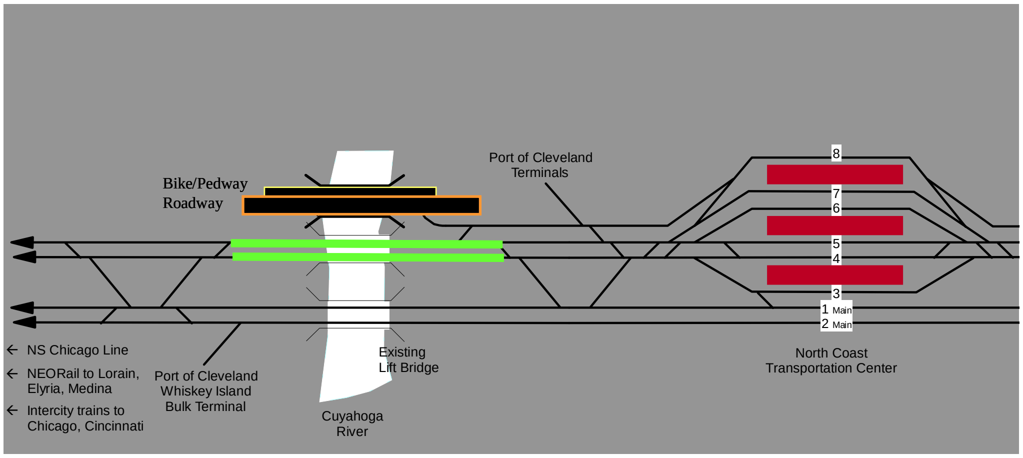
Any new bridge spans would be situated immediately to the north of the existing span, preserving the existing commercial and entertainment land uses located directly south and east of the existing bridge. It is assumed that separate rail and roadway/bikeway/footpath spans would be built, to enable these two spans to be located at different base elevations and to permit staged implementation.

For purposes of this analysis, a new double-track rail span is assumed. The railroad approaches are assumed to have sufficient crossovers to allow for flexible/universal track use by both freight and passenger trains. The operating plan would normally assign passenger trains to the new bridge and freight trains to the existing bridge alignment, but, in the event of a bridge outage or to respond to delays, breakdowns or maintenance activities, it would be possible to route freight trains via the new bridge and passenger trains over the existing bridge as required.

This configuration would permit retention of the existing bridge structure, which is in reasonably good structural condition. Retaining the existing bridge is more cost-effective than replacing it. It also more readily permits staging of construction and allows the existing low-level span and associated track connections to be retained, if desired by NS.

Once the new bridge or bridges are built to the north of the existing bridge, raising the base height of the existing 2-track bridge span would be feasible, if desired. However, a new track connection would need to be built to provide a connection to the Whiskey Island facility. A potential track configuration and arrangement of bridge spans is shown in Figure 3.4.4.

Figure 3.4.4 Expanded Cuyahoga River Crossing at Cleveland Lakefront


Bike/Pedway
Roadway
Port of Cleveland Terminals
8
7
6
5
4
3
1 Main
2 Main
← NS Chicago Line
← NEORail to Lorain, Elyria, Medina
← Intercity trains to Chicago, Cincinnati
Port of Cleveland Whiskey Island Bulk Terminal
Cuyahoga River
Existing Lift Bridge
North Coast Transportation Center

Potential Future Track Configuration

Two basic alternatives were developed for the base elevation of the new Cuyahoga River rail crossing:

- Moderate rise (5-10 ft.)
- Substantial rise (20-25 ft.)

In the former scheme (moderate rise of 5-10 ft.), the westerly approach tracks would meet the existing embankment grade, which begins rising immediately to the west of the river. The easterly bridge approach would transition down to the existing grade level prior to reaching the site of the North Coast Transportation Center. This would enable changes to the current NCTC & lakefront plans to be kept to a minimum. The one major required project would be reconfiguration of the waterfront light rail bridge across the right-of-way. This scheme would result in a greater number of bridge openings than the second option described below. It also would be less costly, preserving the existing Shoreway alignment and the other bridges over the right-of-way between West 3rd Street and East 9th Street.

In the latter scheme (substantial rise of 20-25 ft.), the westerly approach would still be level and meet the existing grade, but it would require construction of a longer embankment than the first scheme. The railroad grade east of the river would be raised to approximately the same height as the bridge elevation (25-30 feet above grade) and supported on a structure. This structure presumably also would be designed to support air rights development of the right-of-way, at least partially offsetting the cost of the structure. This configuration would have the benefit of reducing the length of the grade experienced by NS freight trains operating via the lakefront routes. It also would create a “lower level” beneath the track structure that could be occupied by a relocated light rail line, the freight track access to the port, vehicle parking and a relocated through roadway (Shoreway and/or port access road). At the North Coast station, the station platforms would be one level closer to the city streets, and the station building would be visible from local streets to the south. However, this configuration would be very costly – several hundreds of millions of dollars – and, therefore, must be part of a comprehensive program of lakefront and air rights development.

Issues/Variables

There are a number of outstanding issues that will need to be resolved based on local policy decisions and development actions:

- Port of Cleveland master plan,
- Incorporating rail, vehicular, bike & pedestrian access to/from or around facilities
- Lakefront master plan
- Ultimate configuration of the Shoreway (State Route 2)
- Waterfront light rail line
- Downtown Cleveland Convention Center
- Transportation joint-development potential at and adjacent to NCTC site
- Implementation timing (of multiple projects)
- Coordination & responsibility.

Assumptions to Guide Future Planning

The future configuration of the Lake Erie waterfront will not be decided solely based on transportation interests and concerns, much less those off commuter rail by themselves. At the lakefront, transportation access problems will need to be solved and land development planned in a comprehensive manner. This exercise, as part of the NEORail commuter rail study, has been to raise the possibility of a multi-modal project to improve access across the river that might benefit multiple users and generate broad interest in the further exploration of the potential costs and benefits of such a project.

The work to date has been based on readily available information. More detailed data will need to be generated on the volume and nature of bridge openings and vessel movements, to enable a more precise calculation of the potential capacity benefits (and relative levels of train delay) associated with raising the railroad river crossing by various amounts.

A dialogue should be established and maintained among a wide range of interested parties, including:

- NOACA, City of Cleveland, Port of Cleveland, Cuyahoga County Planning Commission (bikeway/greenway)
- Flats Oxbow Association, Growth Association
- NS, CSX, Amtrak, ORDC (MWRRI, 3-C, statewide goods movement.)

These parties should monitor the progress and review the results and recommendations of ongoing planning efforts, including refinement and implementation of the master plan for the Port of Cleveland, the Flats Transportation Study, North Coast Transportation Center, downtown Cleveland Convention Center, definition of the future Shoreway configuration, and other plans for development at the lakefront.

As these various plans develop and coalesce, a decision will need to be made by the affected stakeholders as to whether or not a constituency exists for funding and implementing the following:

- A new multi-use bridge or bridges across the Cuyahoga River at the lakefront
- Lakefront development sufficient to help support and justify the expense of new bridge capacity.

At some future point in the process, it will be necessary to collect data on the geotechnical conditions at the site, prepare engineering concept plans including alignments, profiles and cross-sections, develop more precise cost estimates, and perform an analysis and evaluation of the alignment, configuration and bridge height alternatives.

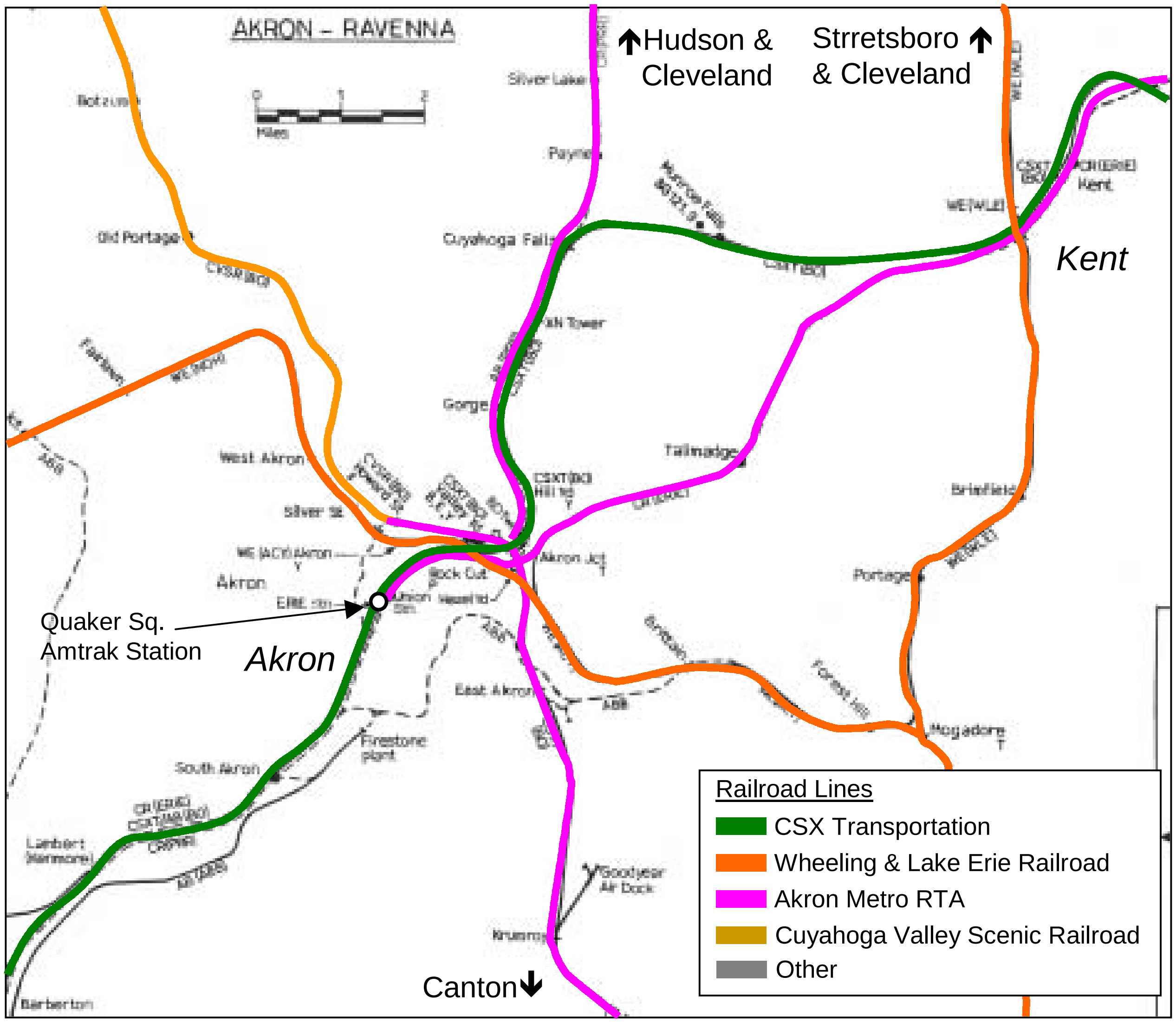
3.5 ACCESS TO DOWNTOWN AKRON

3.5.1 Akron Rail Network

Figure 3.5.1 shows the rail lines that currently serve Akron.

Figure 3.5.1

Akron Area Rail Network



The CSX east-west mainline, known as the Newcastle Subdivision (formerly the main line of the Baltimore and Ohio Railroad) bisects downtown Akron. The Akron Amtrak station at Quaker Square is located on this alignment.

The Cuyahoga Valley Scenic Railroad and the Wheeling & Lake Erie Railroad generally follow the contours of the Cuyahoga River Valley to the north of the Akron business district. The Cuyahoga Valley line runs in the river valley all the way to Cleveland. The Wheeling line is a different route from the one used by NEORail Route 5 between Bedford and Kent, running westward from Mogadore to Medina (the same line used by NEORail Route 3 to access downtown Medina).

Three rights of way also have been acquired by the Akron Metro RTA as possible passenger rail routes. The Hudson to Akron branch line was originally built by the Pennsylvania Railroad but is no longer in service. It parallels the CSX Newcastle Subdivision from Cuyahoga Falls to the outskirts of Akron. The Kent to Akron line through Tallmadge was originally part of the Erie Railroad and also has been abandoned, but the right-of-way remains intact. The Sandyville Subdivision of CSX Transportation, linking Akron to Canton, was also recently acquired by Metro RTA. Limited freight service remains on the northernmost section of this branch line, and Metro RTA has funded restoration of the line to minimum passenger standards.

3.5.2 Alternative Akron Station Locations

There are three potential sites for a commuter rail station serving downtown Akron:

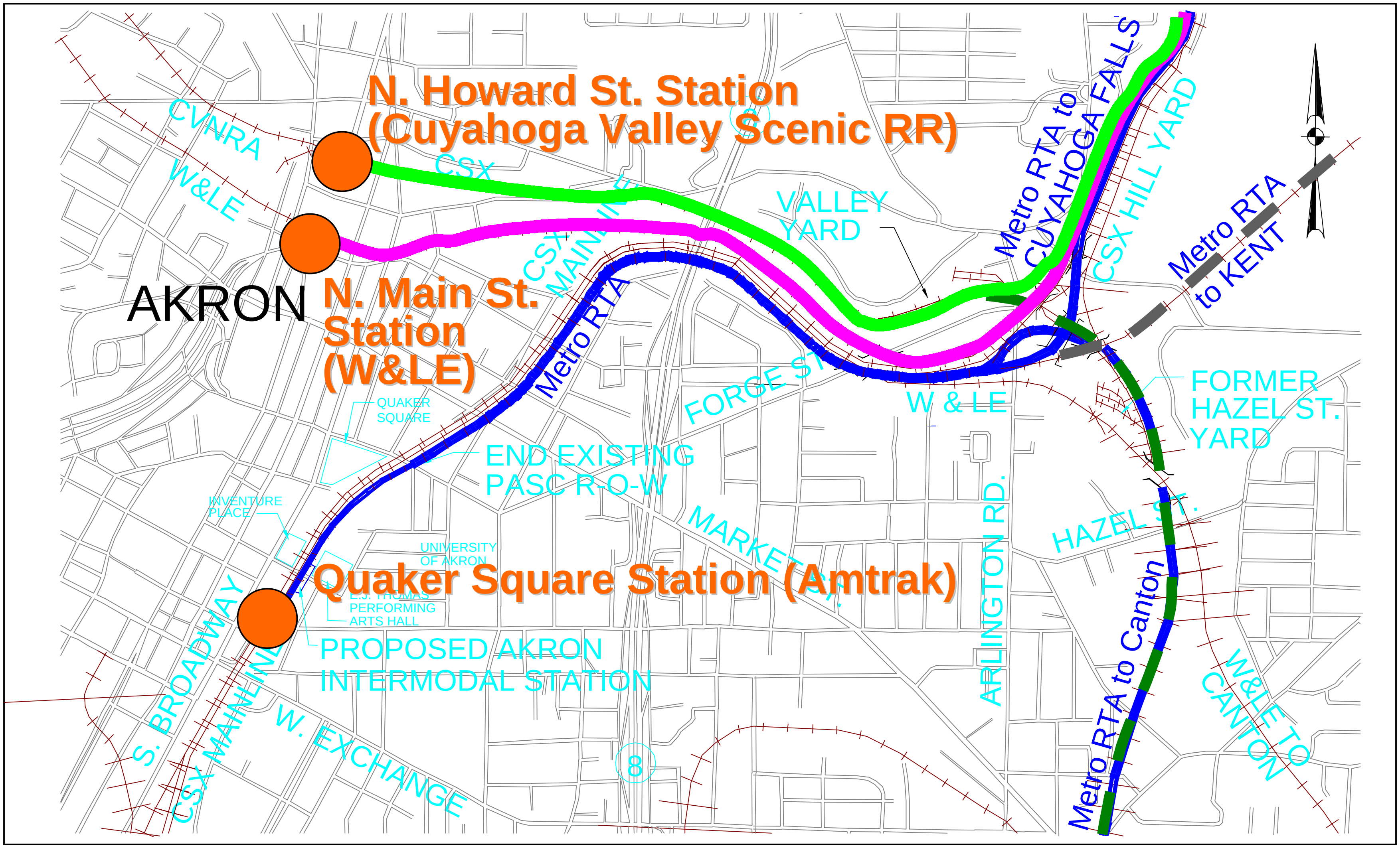
- Quaker Square, on the CSX Newcastle Subdivision
- North Main Street, on the Wheeling & Lake Erie Railroad
- North Howard Street, on the Cuyahoga Valley Scenic Railroad alignment

Figure 3.5.2 shows these three potential station locations in relation to downtown Akron. All three locations have been the site of passenger stations at some time in the past. Two of the locations are still active stations: the Amtrak Three Rivers train between New York and Chicago stops one a day in each direction at the Quaker Square site; and, a station building and passenger platform for the Cuyahoga Valley scenic line have recently been built at North Howard Street.

All three of these sites would require a passenger train operating between Cleveland and Canton on either NEORail Route 4 (via Hudson) or Route 5 (via Kent) to reverse directions at the Akron Station. A fourth location was considered at Arlington Street, on the direct through route between Cleveland and Akron. This location would reduce travel times between Canton and Cleveland by approximately 15 minutes. However, the Arlington Street site is not conveniently situated with respect to downtown Akron, and the travel demand analysis indicated that overall net ridership would decline with Arlington Street as the Akron station, since there is greater demand for travel between Akron and Cleveland than between Canton and Cleveland. Traditional commuter rail equipment, in a “push-pull” configuration with a locomotive at one end and a cab control car at the other end, is capable of being operated in either direction. With an Akron station stop of 7 to 10 minutes, the train engineer has sufficient time to walk the length of the train and conduct a brake test before starting out in the opposite direction.

Figure 3.5.2

Alternative Locations for Akron Rail Station



Each of the three alternative downtown Akron station locations has advantages and disadvantages, as Table 3.5.1 indicates. As of the date of this report, a single preferred site had not been identified, and the City of Akron had indicated a willingness to consider all three options. The siting of the Akron station will be determined at a later stage of the implementation process, perhaps as part of the Canton-Akron-Cleveland major investment study, and will depend upon factors such as local policy and development priorities in the City of Akron and the extent to which agreement can be reached with CSX Transportation concerning commuter rail access onto or across their right-of-way. A feasible railroad alignment and operating plan can be developed for any of the three sites.

Table 3.5.1
Advantages and Disadvantages of Alternative Downtown Akron Station Locations

Location	Advantages	Disadvantages
Quaker Square (CSX)	▪ Convenient walking distance to business district and University of Akron ▪ Co-located with Amtrak station in Akron ▪ Direct rail access towards Kent and Canton	▪ Requires crossing of (or relocation of) CSX main line to access Hudson line ▪ A commuter rail flyover across the CSX main line may be required at Arlington Street ▪ Requires construction of new track parallel to CSX main line between Arlington Street and Quaker Square
North Main Street (W&LE)	▪ Avoids CSX main line ▪ Convenient walking distance to north end of business district ▪ Potentially compatible with nearby development ▪ Direct access to potential train storage & maintenance facility at existing W&LE site	▪ Less direct access to University of Akron and south end of business district ▪ Results in 3 different rail stations in downtown Akron ▪ Requires new track connection to Canton
North Howard Street (CVSR)	▪ Avoids CSX main line ▪ Existing station facility (platform, station building, access road & parking) ▪ Direct rail access towards Canton	▪ Relatively poor access to Akron business district and University of Akron ▪ Requires new track connection to Hudson line (less expensive than Arlington flyover) ▪ Amtrak and commuter rail served by different stations

3.5.3 Required Track Connections

The Arlington Jct. area, located about a mile north and east of the Akron business district, has a remarkable confluence of railroad lines on multiple levels. Virtually all of the railroads serving Akron converge, cross each other and interconnect at Arlington, as Figure 3.5.3 shows – including the potential NEORail commuter routes to Hudson and Cleveland (Route 4), Kent and Cleveland (Route 5) and Canton (both routes).

Each of the three Akron station locations requires a short rail spur from Arlington Jct. to the station site. Generally, these track connections can be made within existing railroad rights-of-way, but, in some cases, new track alignments will need to be graded and new railroad bridge or viaduct structures constructed to provide the required connections between the various lines.

3.5.4 Akron Storage and Maintenance Facility

The NEORail operating plans for the South Corridor call for the overnight storage and minor maintenance of three to as many as nine commuter rail trainsets at Akron. If the Quaker Square site is selected, the storage/maintenance facility is assumed to be located to the west of downtown Akron, along the CSX alignment. Land is potentially available, but the existing CSX main tracks might have to be relocated to provide access to the commuter rail yard separate from the CSX mainline.

The North Main Street site provides a direct track connection to the existing Wheeling & Lake Erie yard and shop facility on the east side of Akron. Space is potentially available at this location for storing and maintaining the commuter rail equipment.

The North Howard Street site would require the construction of a NEORail storage and maintenance facility, most likely at the Valley Yard directly east of the station, which has been acquired by Akron Metro RTA from CSX Transportation.

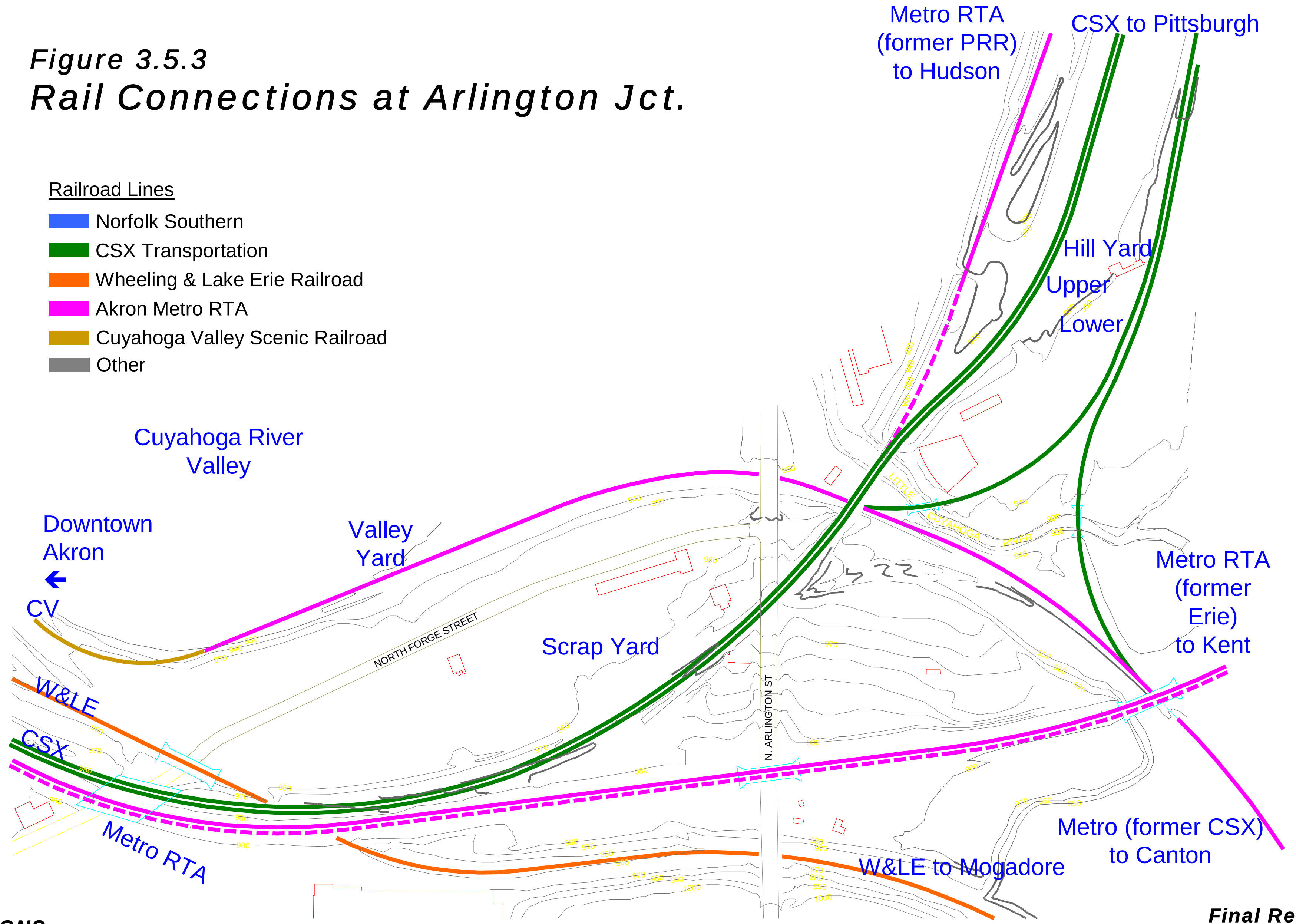
3.5.5 Assumptions for Guiding Future Planning

For purposes of analysis in NEORail Phase II, the Quaker Square site is assumed to be the location of the Akron commuter rail station. The plan and cost estimates allow for the construction of commuter rail tracks and station facilities that are operationally independent of the CSX mainline traffic, including a rail flyover from the Hudson branch line at Arlington Street and new dedicated commuter tracks parallel to the CSX main tracks from Arlington Street to Quaker Square.

The station is assumed to consist of a new island platform with two platform tracks (separate from but adjacent to the current Amtrak station), with a new pedestrian bridge accessing both platforms.

It may be possible to reduce the implementation cost of commuter rail in this corridor by selecting one of the alternative station locations, entering into an agreement with CSX Transportation to permit commuter trains to cross the freight mainline at grade, or constructing a more modest station and storage/maintenance facility.

Figure 3.5.3
Rail Connections at Arlington Jct.



Chapter 4: Phase II Evaluation Methodology and Results

4.1 Evaluation Criteria

4.2 Effectiveness

4.3 Cost

4.4 Cost Effectiveness

4.5 Effects on Rail Freight Operations

4.6 Local Support

4.7 Regional Goals

4.8 Results

CHAPTER 4 - EVALUATION METHODOLOGY AND RESULTS

The purpose of NEORail II was to give regional decision-makers a more detailed understanding of commuter rail's costs and benefits. The study was designed to give local officials and the public a firmer technical basis for considering whether or not Northeast Ohio should pursue a commuter rail program, and if so, which lines of the seven lines should be built first, and what level of service should be offered. This chapter presents the evaluation criteria that were selected for use in NEORail II and summarizes the results of the technical analysis. Additional documentation of the analysis can be found in Appendix F.

4.1. EVALUATION CRITERIA

The evaluation criteria developed for Phase II are rooted in NOACA's *Framework for Action 2025* and, specifically, in the ten regional goals that underlie that document. The regional goals are listed later in this document in Table 4.8. The evaluation methodology used in Phase II is similar to that used in Phase I, but has been modified by the Commuter Rail Advisory Committee (CRAC) in order to address the specific phasing objectives of Phase II.

Also, evaluation criteria are based upon the need to ultimately satisfy applicable federal, state and local criteria for funding of the construction and operation of a commuter rail system.

The CRAC approved seven categories of evaluation criteria for Phase II:

- Effectiveness (ridership)
- Cost (capital and operating and maintenance)
- Cost-Effectiveness (total cost per rider)
- Railroad Coordination
- Development Potential
- Regional Goals
- Local Support (political, and financial)

For each of these criteria, the consultant team developed data that could be used to evaluate alternative commuter rail networks and levels of service, including combinations of routes and corridors. For those criteria that are quantifiable – such as costs and ridership – the evaluation was based on the results of technical studies and analyses prepared by the consulting team.

Other criteria were addressed more subjectively. The willingness of the freight railroads to cooperate and support the development of commuter rail, for example, will be directly proportional to the capital investment that is being proposed to alleviate bottlenecks and provide capacity for future growth of freight as well as passenger traffic. The railroads will tend to look most favorably on investments that enable the physical and operational separation of passenger and freight traffic. The consultant team met with each of the railroads to discuss the NEORail proposals, identify specific investment needs and requirements, and explore alternative solutions to capacity problems. Assumptions were made about the level of investment that would be necessary to gain their cooperation. Similarly, the degree of local support and the extent and nature of any opposition to implementation of commuter rail was assessed through interviews with local officials and the public response obtained at a series of open house meetings throughout the study area. The analysis methodology for each criterion is further described below.

To summarize the results in a single evaluation matrix (shown as Table 4.8 below), the study team in consultation with the CRAC chose to use a basic rating scale of “high”, “medium”, and “low” (as well as variations of these for those borderline ratings, such as “low-medium”). This rating system is relative – it is used to compare each of the routes against the other six routes being studied in NEORail II. Thus, a “high” rating means “one of the best performers” of the seven corridors, and a “low” rating means “one of the worst performers” of the seven corridors. However, the ratings are not meant to rate the performance of the corridors against commuter rail systems in other cities, against Federal guidelines, or against any other “absolute” performance standards. This was done in the Phase I study, as a basis for selecting the seven corridors that were subsequently analyzed in Phase II.

The low-high rating scale became confusing for the criteria dealing with costs, since a rating of “high” could be interpreted as meaning high capital cost, rather than high performance (and low capital cost). For clarity, “high cost”, “moderate cost”, and “low cost” was used for the cost criterion.

4.2 EFFECTIVENESS

The best measure of how well a commuter rail line performs is ridership – how many people use the service on a daily basis. Estimated daily ridership, expressed as total daily boardings, was selected as the most appropriate measure of effectiveness in the evaluation of the seven possible commuter rail routes in Northeast Ohio. Using demographic and regional travel projections developed by the region’s metropolitan planning organizations, projections of future ridership in the year 2025 were prepared. Ridership was estimated for each of the seven routes individually, and also for various possible combinations of routes, so that the potential for a network of routes to serve suburb-to-suburb trips and other trips not oriented to the major central business districts could be understood.

There are three distinct travel markets that are potentially served by commuter rail in each corridor:

- Work trips, principally comprising weekday rush hour “commuters,” to the core central business districts (CBDs) of Cleveland, Akron, and to a lesser extent, Canton – this is the market that commuter rail traditionally serves best.
- Work trips to suburban workplaces, also primarily during the weekday peak periods, including reverse-commute, through-commute and intermediate short-haul trips on the rail system.
- Non-commuter markets, principally during off-peak hours, including university trips, recreational/tourist trips, and non-work trips associated with special events (e.g., sporting or cultural events) and major activity centers.

The potential daily ridership on commuter rail for each of these markets, in each corridor, was estimated for various network configurations and alternative levels of rail service. As part of this analysis, the approximate size of these markets in each corridor was estimated, along with the approximate share that might be captured by a commuter rail service operating in the corridor.

Methodology

The analysis relied heavily but not exclusively on computer modeling of travel demand in the nine-county study area. Professional judgment, based upon experience with commuter rail systems elsewhere in the U.S. in regions of comparable size with comparable peak period travel patterns, was also applied to check the validity of the modeled results, adjust the results to present a more realistic picture of anticipated travel behavior, and account for certain work and non-work travel patterns that are not fully represented in the available computer models.

Estimated ridership for two principal trip purposes – work trips and other trips – were derived using the existing travel demand models of the three metropolitan planning organizations (MPOs), NOACA, AMATS and SCATS, together with a fourth "inter-regional" model that processed trips that cross MPO boundaries (i.e., beginning in one MPO area and ending in another, such as from Hudson to Cleveland). A process was developed for integrating the results of these various models and ensuring that flow volumes across model boundaries are reconciled among the various models.

The Phase II model is network based, has been calibrated to local conditions in Northeast Ohio, accounts separately for work and non-work trips, and examines the effects of competitive modes on commuter rail market share, taking into account the effect on commuter rail ridership of the level of highway congestion and degree of circuitousness of parallel highway routes. Because commuter rail is not an existing mode within the region, its characteristics were derived based upon experience elsewhere in the U.S. Commuter rail service frequencies and running times were based on commuter rail operating plans developed specifically for each alternative level of service in each individual corridor.

The underlying information on the number of projected total daily trips in the year 2025 between origin and destination zones in the region was contained in four sets of matrices or "trip tables" – corresponding to each of the four models and each of the two basic trip purposes (work and non-work). The trip tables comprise several hundred travel analysis zones (TAZs) and are intended to be a reflection of the agreed-upon forecasts of regional travel that underlie the region's comprehensive planning activities and transportation investment planning. The data contained in these tables were provided to the NEORail Study as input and were not developed from scratch as a part of the study. NEORail is the first transportation study to cover the full nine-county area, and the trip tables had to be synthesized from multiple sources. As a result, the MPO trip tables had to be reconciled with one another in terms of the number of trips crossing MPO boundaries, and decisions had to be made concerning the distribution among specific travel zones of those cross-boundary or inter-regional trips.

To make the trip tables easier to understand, the hundreds of TAZs were aggregated up to a set of approximately 60 "districts" – enabling a page-size printout of trip productions and attractions. These tables were produced for the No Build case and for each model run, by trip purpose and travel mode, and are summarized in Appendix G.

The suite of computer models was run for each route and level of service. The estimates produced by these model runs were then examined by the CRAC and the consultant team for their accuracy and reasonableness. Adjustments were made to the model results to better reflect "real life" travel patterns and to account for special event trips (such as trips to sports events and concerts) and special generator trips (such as to universities, amusement parks and museums). A relatively straightforward methodology was employed to adjust the output from the computer model to better reflect projected travel behavior in the region. Such post-processing is a time and cost-effective method of refining model results without the need for iterative recalibrating and revalidating of the model. It is a commonly used process and has proven to be successful in many federally funded major investment studies and transportation plans. All adjustments were made following a consistent approach applied to all seven of the NEORail routes. The specific adjustments are documented below.

The appended tables are based on the results of runs of the NEORail regional travel demand model, with several "post-processor" adjustments made to reflect certain anticipated conditions that are not measured sufficiently in the model. The effects of these adjustments included the following:

1. Home-based other (HBO) short trips -- For non-work trips for a distance of 1 or 2 stations (0-10 mi.), a 90% reduction in trips via commuter rail was assumed. On selected other non-work trip interchanges over longer distances that showed relatively high volumes, a somewhat less drastic reduction was assumed.
2. Home-based work (HBW) trips to Cleveland central business district (CBD) -- we assumed bus services from outer suburbs to CBD would be discontinued. Keeping overall transit mode share constant, we assumed a higher share of all transit trips using commuter rail (up to 90% sub-mode share for suburbs greater than 15 miles distant from the CBD)[*]
3. Home-based work (HBW) trips to Cleveland CBD from Summit and Portage Counties – the combined commuter rail and other transit shares derived by the model were significantly lower compared to the results for districts of a comparable distance from Cleveland in the other NEORail corridors. Therefore, the commuter rail shares were increased to approximately match average conditions among the other corridors (in the range of 15 percent) in the Twinsburg, Macedonia, Streetsboro, Hudson, Kent, Cuyahoga Falls and Akron districts).
4. Special trip generators – For Cleveland and Akron sporting events, college/university trips, recreational/special event trips, and work trips to major suburban employers situated in close proximity to rail stations (where commuter rail trips appear to be under-estimated by the model), the following steps were taken to estimate the number of additional trips expected to use commuter rail:
    - Estimate market size, NEORail share and daily NEORail trips for typical day when trip generation activity occurs

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[*] For Route 5 south of Akron, the circuitousness of the rail route via Kent and the Wheeling & Lake Erie Railroad makes rail travel times to downtown Cleveland relatively uncompetitive compared to direct line haul bus times via I-77. Therefore, in this option, an express bus to downtown Cleveland from Canton, N. Canton, and S. Akron was assumed to remain in service, and the rail mode splits for work trips generated by the model were not increased.

- Factor up to annual trips
- Factor back to "typical daily," dividing by 250.

Results

Although the total number of projected regional trips in the 2025 trip table is only moderately greater than in 1990, the county-to-county flows are, in several cases, significantly different. As described in Chapter 2, the fundamental demographic changes projected for 2025 are:

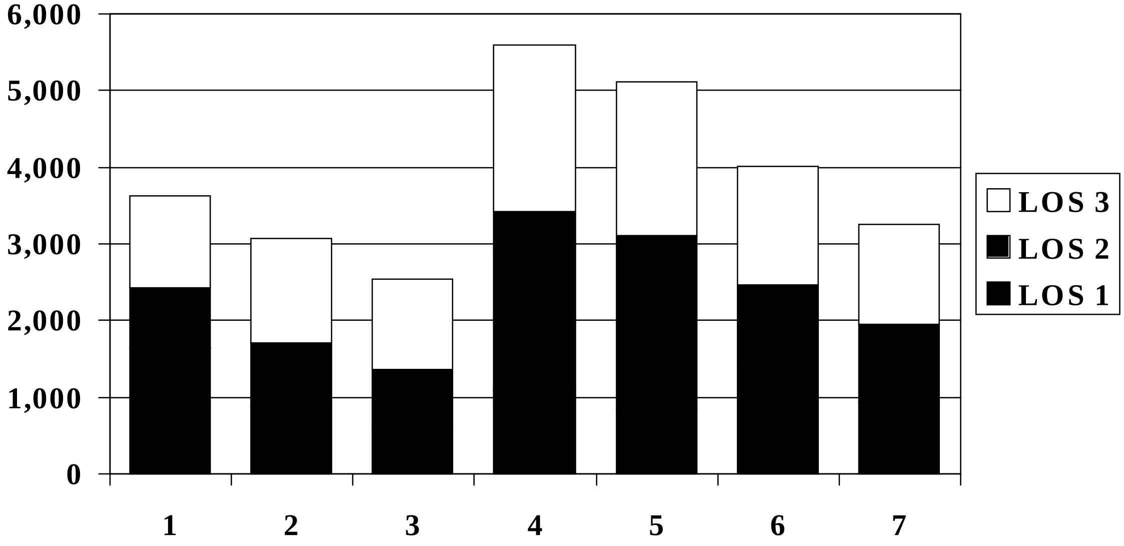
- A loss of employment in downtown Cleveland and the rest of Cuyahoga County
- Significant population growth in the western counties (Lorain and Medina)
- Significant employment growth in the suburban counties, especially Lake County

These projections anticipate the following shifts in regional travel:

- Slight reductions in trip-making to downtown Cleveland from most suburban counties by 2025
- Major reduction in trip-making to downtown Cleveland from Lake County by 2025
- Significant increase in intra-county trips, within the suburban counties.

Figure 4.2.1 presents estimated average daily ridership in the year 2025, for each of the seven NEORail routes as a stand-alone service. The graph shows the range in ridership associated with the three different levels of service that were analyzed. The estimates for Level of Service 1 include only trips in the weekday peak direction of travel – towards Cleveland in the morning and away from Cleveland in the evening. Levels of Service 2 and 3 add increments of reverse-peak and off-peak service, which result in additional riders. The year 2025 ridership estimates, rounded to the nearest hundred (reflecting the relative precision of the estimates) are presented in Table 4.2.1 for each individual route at Level of Service 3, the high end of the range, including a breakdown of ridership among the three travel markets served. In order to assign a rating to each route, a range was developed and each route was assigned to a low-high scale. Estimated ridership of 5,000 or more received a high rating and ridership estimates below 3,000 received a low rating. These ratings of potential ridership are relative to each other, not reflective of absolute performance.

Figure 4.2.1
Ridership by Route, Daily Trips



Appendix G presents estimated station-to-station daily ridership estimates for each route, along with information on cumulative line loadings and selected regional travel data for each corridor. A one-page ridership summary table is also presented in Appendix G for each of the seven commuter rail routes as a stand-alone service, at the highest level of service (LOS 3). These tables present a station-to-station matrix of total daily trips, as well as information on cumulative line loadings and selected regional travel data for each corridor. In addition, the tables break out the following three travel markets in each corridor:

- Peak period, peak direction (including commuters to Cleveland),
- Peak period, reverse-peak direction (including commuters to suburban workplaces),
- Off-peak.

Table 4.2.1
Effectiveness – Estimated Commuter Rail Ridership (Daily Trips in Year 2025)

Route	1 Lake West Lorain	2 West Amherst	3C South West Medina	4 South Via Hudson	5 South Via Kent	6 East Aurora	7 Lake East Ashtabula
Rating	Medium - High	Low - Medium	Low	High	High	Medium - High	Medium
Total Daily Boardings	3,620	3,070	2,540	5,600	5,120	4,020	3,260
Peak Period, Peak Direction	2,040	1,110	790	2,401	2,136	1,800	1,420
Peak Period, Reverse Direction	220	360	320	864	944	410	270
Off-Peak, Both Directions	1,360	1,600	1,430	2,333	2,037	1,810	1,570

Notes:

- ➢ Results reflect enhanced service operating scenario (Level of Service 3)

Note: For comparative purposes, estimated ridership reflects enhanced service operating scenario (LOS 3), which may not prove to be warranted in all cases.

Evaluation

Corridors 1 and 2: The magnitude of demand is similar in these corridors. Route 1 outperforms Route 2 largely because the inner portion of Route 2 closely parallels the RTA Red Line, whereas the inner portion of Route 1 picks up a considerable number of passengers (though a small share of total trips) from Lakewood. Route 2 also has significantly fewer non-work trips, in the HBO trip table.

Corridor 3, like Corridor 2, parallels the Red Line approaching Cleveland, and a large majority of trips from Brook Park and west Cleveland are assigned to the Red Line rather than commuter rail. Also, the rail alignment in Medina County runs along the western edge of the developed area in Cuyahoga and Medina Counties, generally with longer access links in the model from TAZ centroids to NEORail train stations than to I-71.

Trips in Corridors 4 and 5 are dispersed among the multiple work trip destinations – the business districts of Cleveland, Akron and Canton, and the large zone of employment in the area of Walton Hills, Macedonia and Twinsburg. Taken together, the ridership potential in these corridors for all markets is potentially the highest in the region. However, no single market is dominant, and a limited route network serving only one of the business districts would not perform as well as other corridors in terms of ridership potential.

Corridor 6 exhibits strong demand, driven by higher commuter rail mode splits than modeled elsewhere in the region. These higher mode splits are most likely due to a combination of factors, including …

- Parallel highway routes to the Cleveland CBD being somewhat more circuitous and congested than in other corridors, and
- TAZ access links favoring trips to park-and-ride locations versus highway interchanges.
- Had commuter rail service as recently as the late 1970s, more recently than in other corridors.
- A significant concentration of employment in the vicinity of Solon, particularly in the vicinity of a proposed station at Harper Road
- Proximity of the rail line to the large amusement parks at Geauga Lake, including the former Sea World park now owned by Six Flags, with the potential to attract both employees and visitors to the rail line.

Corridor 7 exhibits moderate ridership potential, when considered in the context of the projected year 2025 trip table, which shows a decline in the number of total daily trips between Lake County and downtown Cleveland compared to 1990 – driven by an expected increase in employment within Lake County. To the extent that significant numbers of Lake County residents continue to work in Cleveland, actual ridership potential on this line could be greater than indicated in the NEORail projections.

Route Combinations

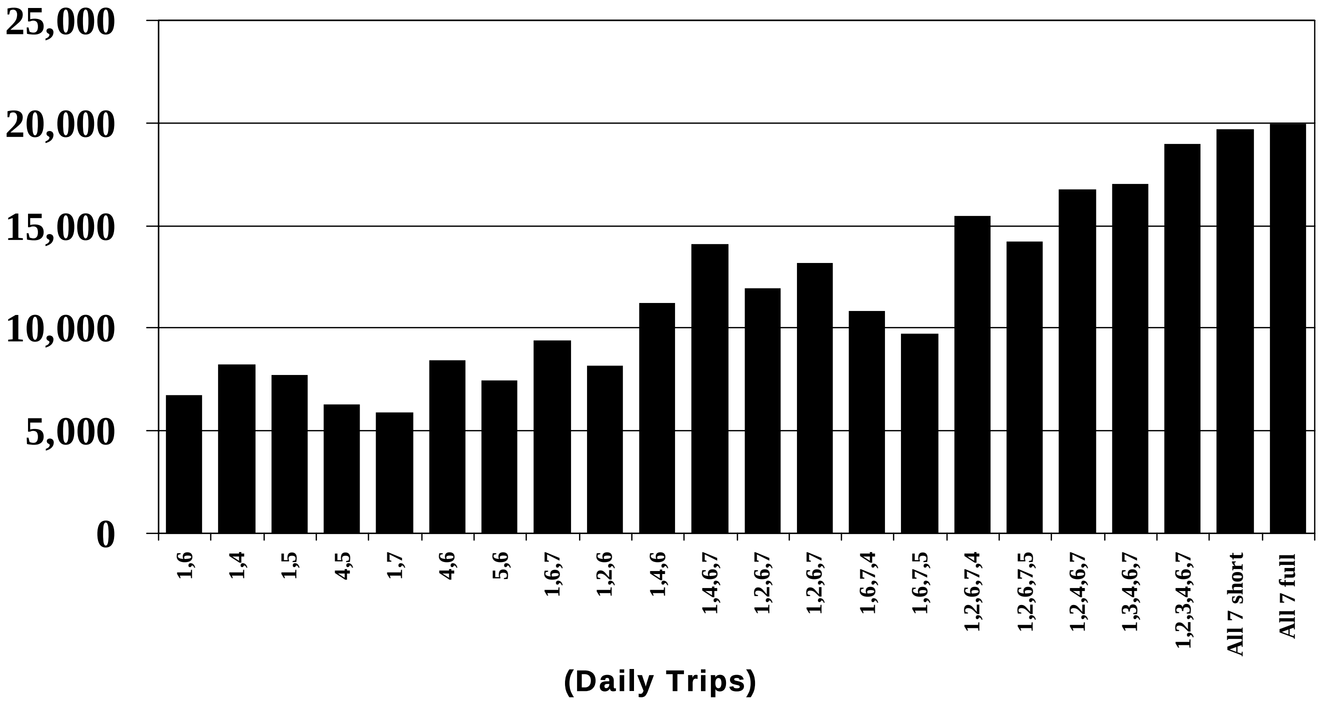
Figure 4.2.2 shows the effect on ridership of combining NEORail routes into a Northeast Ohio commuter rail network. For selected combinations of multiple routes, the estimated total ridership at Level of Service 3 is shown, in comparison to the sum of the ridership on each route as a stand-alone service. Ridership on multiple routes is not additive, for several reasons:

- Route combinations that include an “east side” and a “west side” route offer the opportunity for long, non-CBD rail trips across the region; if these routes are operated as one long route, with Cleveland as an intermediate stop, there is the opportunity for a “one-seat ride” between stations on the east and west sides of town, which will be relatively attractive for people making that trip.
- Route combinations that provide convenient opportunities for passengers to transfer from route to another, either at downtown Cleveland or another point where routes intersect such as Hopkins International Airport or the E.88th Street and Union Ave., will generate additional ridership, albeit at lower levels than where “one-seat rides” are offered.
- Routes that are relatively close together compete with each other for some of the same riders. As a result, ridership on two parallel routes together may be less than the sum of the estimated ridership on each route individually.

As the figure shows, Route 1 (the Lake West Corridor, to Lorain) in combination any of the routes on the east side of Cleveland provides a significant gain associated with through trips, on the order of five percent of total ridership. Combinations of three or more routes, with branches on both the west and east sides of Cleveland, provide the largest potential boost in potential daily ridership. The competitive effects of closely parallel routes are felt most strongly with combinations of Routes 4 and 5 (the two alternative routes in the South Corridor), Routes 5 and 6

(South and East Corridors) and Routes 1 and 2 (Lake West and West Corridors). As a result, these combinations should probably be excluded from the initial, highest priority commuter rail investments.

Figure 4.2.2
Ridership for Combinations of Commuter Rail Routes



Comparison with other systems

Table 4.2.2 presents a comparison of projected daily ridership on each of the stand-alone NEORail routes with existing commuter rail routes across the U.S. The table omits the larger U.S. systems, including New York, New Jersey, Boston, Philadelphia, Chicago and San Francisco. The table highlights the relative magnitude of ridership by route or branch line. Most of the existing routes operate at a level of 4,000 daily trips or above, although there are several existing routes at or below the level of traffic projected for the NEORail routes. On a rider per mile basis, several of the NEORail routes are competitive with existing services.

Table 4.2.2
Comparative Daily Ridership
NEORail Versus Smaller U.S. Commuter Railroads

City/Region	Route	Route Miles	Sta-tions	Daily Trains	Daily Trips	Riders/ Mile
NEORail	Route 1 – Lorain	27	7	24	3,620	134
NEORail	Route 2 – Elyria	32	7	24	3,070	96
NEORail	Route 3 – Medina	33	7	24	2,540	77
NEORail	Route 4 – Canton-Akron-Cleve.	62	18	24	5,600	90
NEORail	Route 5 – Canton-Akron-Cleve.	70	18	24	5,120	73
NEORail	Route 6 – Solon-Aurora	31	9	24	4,020	130
NEORail	Route 7 – Painesville	67	13	24	3,260	49
Dallas-Ft.Worth, TX	Trinity Railway Express	14	4	54	4,900*	350
Miami-Palm Bch., FL	Tri-Rail	71	18	28	9,300	131
New Haven, CT	Shore Line East	33	9	16	1,200	36
Washington, DC	VRE-Manassas	35	10	18	4,700	134
Washington, DC	VRE-Fredericksburg	53	12	12	5,600	106
Washington, DC	MARC Camden (Baltimore)	37	12	11	3,200	86
Washington, DC	MARC Brunswick	73	17	16	5,000	68
San Diego, CA	Coaster: S.D.-Oceanside	42	8	22	4,500	107
Los Angeles, CA	Metrolink-Ventura	66	11	30	3,700	56
Los Angeles, CA	Metrolink-Antelope Valley	77	9	22	5,000	65
Los Angeles, C	Metrolink-San Bernardino	56	13	28	9,700	173
Los Angeles, CA	Metrolink-Riverside	59	6	12	4,600	78
Los Angeles, CA	Metrolink-Orange County	87	19	19	6,000	69
Los Angeles, CA	Metrolink-Inland Empire	71	9	15	2,900	41
San Jose, CA	Altamont Commuter Express	86	9	6	4,400	51
Seattle, WA	Sounder	40	7	4	1,800*	45

* New service – projected to expand.
Source: 1st Quarter 2001 ridership data for existing railroads; 2025 projections for NEORail routes.

4.3 COST

4.3.1 Capital Costs

The capital costs of implementing commuter rail service in each of the seven corridors have been estimated, based on recent experience for comparable capital investment in Northeast Ohio and on other U.S. commuter rail systems. Capital cost estimates were prepared for each route, route combination and level of service option. The estimates reflect the cost of the infrastructure, facilities and equipment that would be required to operate commuter rail service at the volume and frequency of service described in the proposed operating plans.

As was the case with ridership, three scenarios are considered, covering the range of expected investment in rail infrastructure and facilities. The scenarios include:

- Low – consistent with operations at Level of Service (LOS) 1 – including terminal facilities, rolling stock, simple stations, and minimal investment in other rail infrastructure.

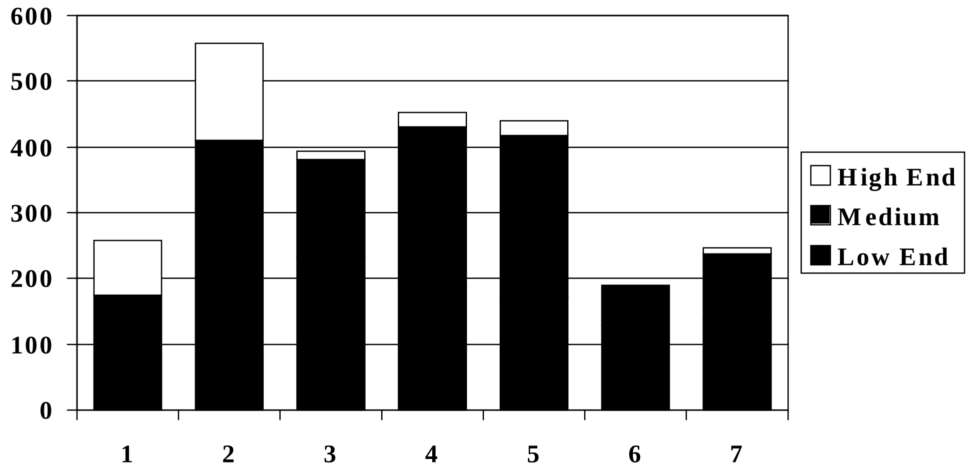
- Base – consistent with operations at Level of Service (LOS) 2 – including the above, plus a realistic level of rail infrastructure investment to support limited bi-directional commuter operations with increased capacity at major bottleneck points.
- High – consistent with operations at Level of Service (LOS) 3 – including all of the above, plus extensive separation of commuter and freight traffic where dictated by high existing or projected future volumes of freight traffic.

The “minimum” cost necessary to serve the core commute market includes rolling stock, stations, support facilities, required physical track connections, upgraded rail infrastructure to support an acceptable level of service and investments to increase capacity as necessary at bottleneck points. On the heavily used rail freight lines, the required investment in capacity improvements will need to be negotiated with the railroads. The analysis therefore carries a range of costs to reflect the uncertainty of these requirements.

Additional capital costs may be required to support the suburban work markets, including additional stations and additional rail infrastructure to support bi-directional commuter service. The core commute market can be satisfied by operating trains only in one direction at a time – effectively on a single track. Bi-directional service will require passing sidings on single-track lines and may require additional main tracks for commuter trains on busy freight lines.

Figure 4.3.1 presents the range of estimated capital costs for the potential Northeast Ohio commuter rail routes, as stand-alone services. Table 4.3.1 summarizes the estimated capital costs and qualitative, relative ratings of the estimated capital cost for each of the seven corridors. Costs are presented in millions of year 2000 dollars and include a 30 percent overall contingency (appropriate for the early stages of planning), plus an add-on for required planning and environmental documentation, engineering design, construction management and overall agency program management (a 25% markup on the estimated cost).

Figure 4.3.1
Range of Estimated Capital Costs, by Route
(millions of 2001 dollars)



These costs include the following types of investments in infrastructure, facilities and equipment:

- Required track connections, line capacity, signaling and other railroad infrastructure improvements,
- Grade crossing upgrades and improvements as required,
- Commuter rail stations, with parking as required to support projected ridership growth,
- Utility relocation as required, including power lines and fiber optic cables within or adjacent to existing rights-of-way,
- Property acquisition, for right-of-way expansion beyond existing railroad property lines and at stations,
- Rolling stock, and rolling stock storage and maintenance facilities, and
- Potential safety and noise mitigation efforts.

Estimated capital costs developed at the project line item level have been aggregated into categories within three general groupings: common facilities (those that would be used by any commuter line serving downtown Cleveland), route-specific facilities, and rolling stock. There are opportunities for reducing the capital cost of a commuter route by sharing common terminal facilities (such as the North Coast Transportation Center), if a network of multiple lines is created. Also, it may be possible to reduce the cost of procuring a rolling stock fleet by leasing instead of purchasing equipment.

A more detailed breakdown of anticipated capital costs, along with schematic track diagrams showing the existing and future configuration of the railroad and highlighting significant capital investments, is presented in Appendix G. All estimates are conceptual and subject to change as concepts are refined and preliminary engineering is undertaken.

Table 4.3.1
Capital Costs (Millions of 2000 Dollars)

Route	1 Lake West Lorain	2 West Elyria	3C South West Medina	4 South Canton Via Hudson	5 South Canton Via Kent	6 East Aurora	7 Lake East Ashtabula
Rating	Low - Cost	High Cost	Medium - High Cost	Medium - High Cost	Medium - High Cost	Low Cost	Medium Cost
Data: LOS 1	$107	$203	$231	Cuy Falls $188	Kent $172	$128	Mentor $140
LOS 2	$174	$376	$381	$392	Canton $418	$166	Conneaut $238
LOS 3	$258	Amherst $557	$394	$453	$440	$190	Conneaut $246

The following tables (Tables 4.3.2–4.3.8) present a route-by-route summary of significant capital investment requirements identified in each corridor and included in the capital cost estimates shown above. Additional detail is provided in Appendix G.

Table 4.3.2 Route 1 Required Capital Projects and Estimated Capital Costs (Millions):

	LOS 1 to Lorain	LOS 2 to Lorain	LOS 3 to Lorain
N. Coast Transp.Ctr. (NCTC)	$7.4	$33.1	$33.1
E.26th St. Yard & Shop	$10.8	$10.8	$10.8
Erie-Nickel Plate Connection		$33.5	$33.5
3rd main track, Cuy. Riv. to Alcott Jct.	$9.2	$9.2	$80.6
Alcott connection (NS Chicago Line & NS Nickel Plate Line)	$7.8	$7.8	$7.8
Grade crossing upgrades – Lakewood	$1.3	$1.3	$1.3
Grade crossing upgrades – Rocky River-Lorain	$9.7	$9.7	$9.7
Passing siding extension – Rocky River	$4.2	$4.2	$4.2
Passing siding – Rocky River	—	$5.0	$5.0
Passing siding – Avon	—	$2.9	$2.9
Passing siding – Lakewood-Rocky River	—	—	$1.7
Double-Tracking—Westlake-Avon	—	—	$10.4
Lorain Grove Site track connection	$2.8	$2.8	$2.8
Track upgrade, NS Nickel Plate Line	$1.3	$1.3	$1.3
Commuter Rail Stations	$10.9	$10.9	$10.9
Overnight storage yard: Lorain	$2.8	$2.8	$2.8

Table 4.3.3 Route 2 Required Capital Projects and Estimated Capital Costs:

	LOS 2 to Elyria	LOS 2 to Amherst	LOS 3 to Amherst
N. Coast Transp.Ctr. (NCTC)	$33.1	$33.1	$33.1
E.26th St. Yard & Shop	$10.8	$10.8	$10.8
Erie-Nickel Plate Connection	$33.5	$33.5	$33.5
New Cuyahoga River lift bridge (4 main trks.)	$80.6	$80.6	$80.6
▪ 3rd main track, Cuyahoga River Bridge to Alcott	$9.2	$9.2	—
Additional Track, Alcott to Puritas	$14.3	$14.3	—
4-Track Mainline Alcott to Puritas			$27.3
New single-track alignment past Hopkins Airport to Berea	$34.8	$34.8	—
New double-track alignment past Hopkins Airport to Berea	—	—	$118.4
Hopkins Airport Side Platform Station	$7.8	$7.8	—
Hopkins Airport Terminal Station	—	—	$20.7
Berea Junction Trackwork	$13.1	$13.1	$13.1
3rd Track, Berea to Elyria	$32.5	$32.5	$32.5
4th Track, Berea to North Ridgeville	$25.2	$25.2	$25.2
3rd Track, Elyria to Amherst		$25.4	$25.4
NS Replacement Siding, Olmsted Falls to North Ridgeville	$10.0	$10.0	$10.0
Elyria Passing Siding	—	$4.6	$4.6
Grade Crossing Upgrades	$5.9	$5.9	$5.9
Terminal Facilities	$4.0 (Elyria)	$4.3 (Amherst)	$4.3 (Amherst)
Stations	$21.4	$24.9	$26.0
Rolling Stock	$40	$40	$50

Table 4.3.4 Route 3 Required Capital Projects and Estimated Capital Costs:

	LOS 2 to Medina	LOS 3 to Medina
N. Coast Transp.Ctr. (NCTC)	$33.1	$33.1
E.26th St. Yard & Shop	$10.8	$10.8
Erie-Nickel Plate Connection	$33.5	$33.5
3rd main track, Cuy. Riv. to Alcott	$9.2	—
New Cuyahoga River lift bridge (4 main tracks)	$80.6	$80.6
Additional Track, Alcott to Puritas	$14.3	—
4-Track Main Line, Alcott to Puritas	—	$27.3
Track Connections, Airport to Medina	$122.6	$122.6
Passing Sidings, Airport to Medina	$10.1	$10.1
Grade Crossing Improvements	$4.1	$4.1
Overnight storage yard: Medina	$6.3	$6.3
Stations	$16.1	$16.1
Rolling Stock	$40	$50

Table 4.3.5 Route 4 Required Capital Projects and Estimated Capital Costs– CAC via Hudson:

	LOS 2 Clev-Akron via Hudson LOS 1 Akron-Canton	LOS 3 Clev-Akron via Hudson LOS 2 Akron-Canton	LOS 3 Clev-Akron via Hudson
N. Coast Transp.Ctr. (NCTC)	$33.1	$33.1	$33.1
E.26th St. Yard & Shop			
Phase I	$10.8	$10.8	
Phase II			$13.2
3rd Track, NCTC to Kinsman	$15.1	$15.1	$15.1
3rd and 4th Tracks, Kinsman to Erie Crossing	$15.2	$15.2	$15.2
Additional Passenger Track, Union/Harvard to Bedford	$20.3	$20.3	$20.3
WLE RR Relocation	$5.3	$5.3	$5.3
3rd Track, Bedford to Hudson	$76.2	$76.2	$76.2
Hudson Flyover	$23.1	$23.1	$23.1
Track Upgrades, Bedford to Arlington	$20.4	$20.4	$20.4
Passing sidings, Bedford to Arlington	$11.1	$11.1	$11.1
Arlington Flyover, Single Track	$17.6	$17.6	$17.6
4-Track Line, Arlington to Akron	$25.1	$25.1	$25.1
Canton Connection	$4.7	$4.7	$4.7
Akron Terminal	$7.3	$7.3	$7.3
Track Upgrades, Akron to Canton	—	$8.7	$8.7
Passing Sidings, Triplett, North Canton	—	$7.2	$7.2
Signal Upgrades (ABS), Akron to Canton	—	$12.3	$12.3
Canton Terminal	$3.3	$3.3	$3.3
Grade Crossing Improvements, Cleveland to Canton	$9.6	$9.6	$9.6
Stations	$31	$31	$31
Rolling Stock	$60	$70	$90

Table 4.3.6 Route 5 Required Capital Projects and Estimated Capital Costs – CAC via Kent:

	LOS 2 Clev-Akron via Kent LOS 1 Akron-Canton	LOS 3 Clev-Akron via Kent LOS 2 Akron-Canton	LOS 3 Clev-Akron via Kent
N. Coast Transp.Ctr. (NCTC)	$33.1	$33.1	$33.1
E.26th St. Yard & Shop Phase I	$10.8	$10.8	
Phase II			$13.2
3rd Track, NCTC to Kinsman	$15.1	$15.1	$15.1
3rd and 4th Tracks, Kinsman to Erie Crossing	$15.2	$15.2	$15.2
Additional Passenger Track, Union/Harvard to Bedford	$20.3	$20.3	$20.3
WLE RR Relocation	$5.3	$5.3	$5.3
W&LE track upgrade, White-Kent	$61.0	$61.0	$61.0
Passing Sidings, Bedford-Akron	$19.4	$19.4	$19.4
Erie track upgrade, Kent to Arlington	$27.3	$27.3	$27.3
Upgrade Plum Jct.	$7.3	$7.3	$7.3
4-Track Line, Arlington to Akron	$25.1	$25.1	$25.1
Canton Connection	$4.7	$4.7	$4.7
Akron Terminal	$7.3	$7.3	$7.3
Track Upgrades, Akron to Canton	—	$8.7	$8.7
Passing Sidings, Triplett, North Canton	—	$7.2	$7.2
Signal Upgrades (ABS), Akron to Canton	—	$12.3	$12.3
Canton Terminal	$3.3	$3.3	$3.3
Grade Crossing Improvements, Cleveland to Canton	$23.6	$23.6	$23.6
Stations	$22.7	$22.7	$22.7
Rolling Stock	$70	$80	$100

Table 4.3.7 Route 6 Required Capital Projects and Estimated Capital Costs:

	LOS 3 to Aurora	LOS 3 to Mantua	LOS 3 to Mantua shorter headways
N. Coast Transp.Ctr. (NCTC)	$33.1	$33.1	$33.1
E.26th St. Yard & Shop Phase I	$10.8	$10.8	$10.8
3rd Track, NCTC-Kinsman	$15.1	$15.1	$15.1
3rd & 4th Tracks, Kinsman-Erie Crossing	$15.2	$15.2	$15.2
Track upgrade, NS Randall Secondary	$11.3	$11.3	$11.3
New Track, Aurora to Mantua	—	$6.5	$6.5
Signaling and CTC	$2.0	$2.0	$2.0
Passing Siding-Solon	$4.4	$4.4	$4.4
Passing Siding-Aurora	$3.6	$3.6	$3.6
Grade Crossing Improvements	$2.6	$4.6	$4.6
Stations	$16.5	$18.1	$18.1
Rolling Stock	$40	$50	$50

Table 4.3.8 Route 7 Required Capital Projects and Estimated Capital Costs:

	LOS 2 to Painesville, LOS 1 to Madison/ Conneaut	LOS 3 to Painesville, LOS 1 to Madison/ Conneaut	LOS 3 to Madison, LOS 1 to Conneaut
N. Coast Transp.Ctr. (NCTC)	$33.1	$33.1	$33.1
E.26th St. Yard & Shop Phase I	$10.8	$10.8	$10.8
Track Upgrades			
NCTC-Collinwood	$0.5	$0.5	$0.5
Collinwood-Painesville	$2.2	$2.2	$2.2
Painesville-Madison	$0.5	$0.5	$0.5
Madison-Conneaut	$2.4	$2.4	$2.4
CSX Replacement Storage Tracks, west of Collinwood	$5.1	$5.1	$5.1
Collinwood Yard --3rd main track & interlocking reconfig.	$33.7	$33.7	$33.7
New Track			
Collinwood-Mentor	$26.4	$26.4	$26.4
Mentor-Painesville	$10.1	$10.1	$10.1
Painesville-Madison	—	$26.3	$26.3
Passing siding			
West End	—	$4.4	$4.4
Willoughby-Mentor	$6.6	$6.6	$6.6
Painesville	—	$3.6	$3.6
Storage Facilities	$2.6	$5.1	$5.1
Grade crossing upgrades	$2.5	$6.3	$6.3
Stations	$18.3	$18.3	$18.3
Rolling Stock	$40	$50	$50

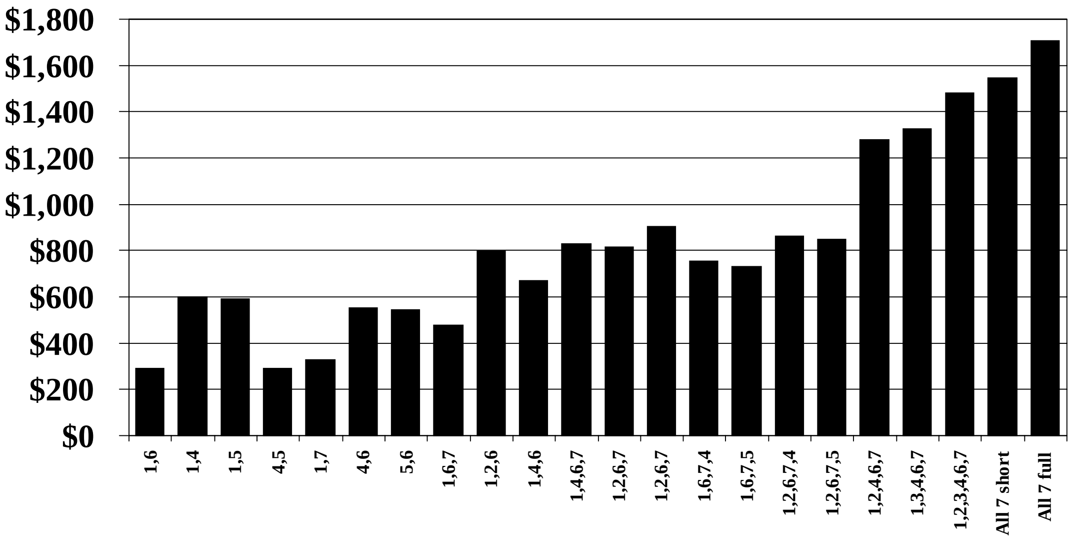
Route Combinations

Figure 4.3.2 presents the total capital costs associated with various combinations of NEORail routes. For selected combinations of multiple routes, the estimated total cost to enable rail operations and Level of Service 3 is shown, in comparison to sum of the capital costs of each individual route as a stand-alone service. As is the case with ridership, capital costs for route combinations are not additive. Certain facilities can be used by more than one route, resulting in an overall cost savings for the routes combined together. These common facilities include:

- The North Coast Transportation Center and associated trackage and rail infrastructure, in downtown Cleveland
- The Cleveland rail yard and maintenance shop facility at the East 26th Street Yard
- Line capacity improvements, where routes share the same right-of-way, such as the rail line from downtown Cleveland to Erie Crossing (shared by Routes 1, 4 and 5), or a new Cuyahoga River lift bridge (which could be shared by Routes 1, 2 and 3)
- Headquarters facility, including administrative, support and customer service functions, and a system operations center
- Spare rolling stock, required to account for anticipated equipment maintenance and repair needs.

As examples, the sum of the capital costs of Routes 1 and 6 individually (i.e., as single, stand-alone services) would be $340 million, but the total capital cost to implement these two routes together is estimated to be $296 million, representing a “savings” of approximately $44 million (13 percent). Or, the cost of adding Route 4 (Canton-Akron-Cleveland via Hudson) on top of a network that already includes Route 6 (Cleveland-Solon-Aurora) would be approximately $388 million, compared with an estimated $453 million required to implement this route by itself – a “savings” of $65 million.

Figure 4.3.2
Capital Costs for Combinations of Commuter Rail Routes
(Millions of 2000 Dollars)



4.3.2 Operating and Maintenance Cost

Annual operations and maintenance costs were estimated, using a methodology developed initially for a comprehensive planning study of the MARC commuter rail system in Maryland and later adapted for general purpose assessment of commuter rail costs. Variations of this methodology have been used in Virginia, Florida, New Jersey, Minnesota and elsewhere to predict the costs of operating new or expanded commuter rail services. Operating costs, according to this model, are a function of the number of train crews, the number of daily trains, train-miles and car-miles, the level of passenger activity and the number of system route-miles and stations. Cost factors have been developed for these variables, measured in year 2000 dollars, reflecting the current state of the industry along with any unique local conditions that may contribute to operating costs, including anticipated access fees charged by railroad right-of-way owners for commuter service over their trackage, and premium costs for liability insurance.

Several of the cost factors, such as most categories of labor, fuel and other energy costs, have risen more than the average rate of inflation over the past three years, and these costs, as well as others, have been updated based on recent experience in other cities where commuter rail is being operated or planned.

Recognizing that freight railroad access fees are negotiable with each railroad, fees currently being paid by existing commuter rail operators have been examined, and an appropriate range of fees for Northeast Ohio has been estimated.

Figure 4.3.3 and Table 4.3.2 present the range of estimated annual operations and maintenance (O&M) costs for the potential Northeast Ohio commuter rail routes. As was the case with the ridership estimates, the low end of the cost range is based on three peak trains into the Cleveland central business district in the morning peak, with three trains operating out towards the end of the line in the evening peak. The base or medium scenario is based on six daily round trips, including limited reverse-peak and mid-day service. The high end of the range incorporates more frequent peak and reverse-peak service and expanded off-peak service, assuming a total of eleven to twelve daily round trips. These estimates are for normal weekday service, on 250 days per year (excluding major holidays). They do not include the additional costs of operating any special trains (e.g., late night baseball/football return trains, special excursion trains, etc.), and they do not include any costs for weekend service.

Operating costs typically are not subject to the same economies of scale when combining multiple routes together, as is the case for both capital costs and ridership. However, there is one large operating cost line item – the annual premium cost for liability insurance – that will be a substantial cost regardless of the size of the rail network and will tend not to increase proportionally with the size and cost of the network. This analysis has assumed a lump sum annual cost of $2 million for liability insurance. Adding more than one route to the network is assumed to have no effect on these costs, making multiple-route networks more attractive than stand-alone routes in terms of annual O&M cost.

Figure 4.3.3
Estimated Annual Operations and Maintenance Costs

(millions of 2001 dollars per year)

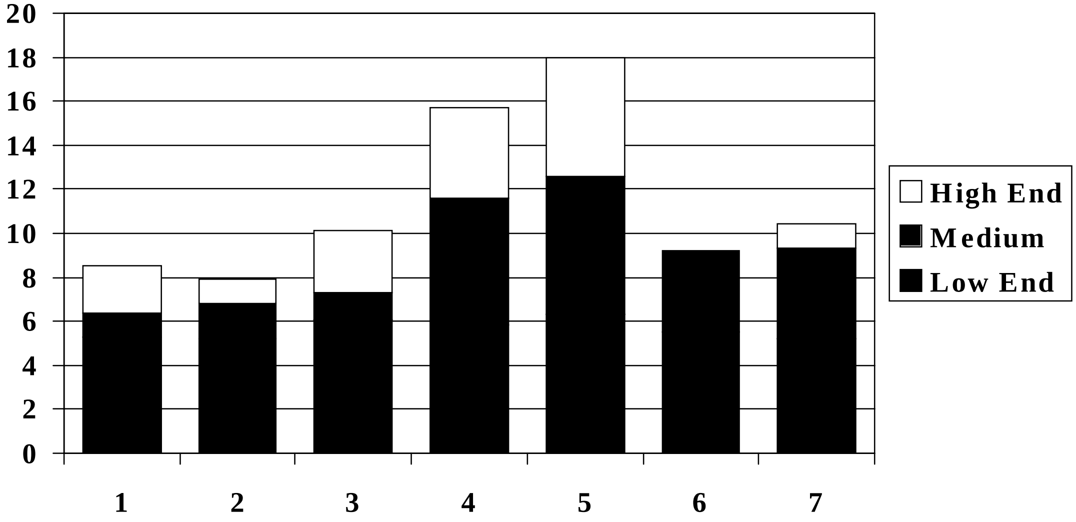


Table 4.3.2
Operating & Maintenance Cost
(2000 Dollars)

Route	1 Lake West Lorain	2 West Amherst	3C South West Medina	4 South Via Hudson	5 South Via Kent	6 East Aurora	7 Lake East Ashtabula
Weekday O&M Cost	$8.9 million	$9.5 million	$10.3 million	$14.8 million	$16.7 million	$10.2 million	$12.6 million

4.4 COST-EFFECTIVENESS

For each route, the operating plan scenarios generate different levels of ridership and different estimates of total cost. The relative cost-effectiveness of each scenario then can be plotted graphically and tabulated. The resulting measure is one of the principal criteria for weighing the relative benefits and costs of alternative transportation investment and service strategies. Cost-effectiveness generally is considered the best measure of the relative performance of alternative route configurations and service levels, because it directly relates the magnitude of the effectiveness of the service and benefits received (i.e., ridership) with the costs associated with delivering that service.

The goal of the analysis is to find that combination of service assumptions for each route that generate the most cost-effective service. The scope of the Phase II analysis is more detailed than that carried out in Phase I, but at this early stage of the process it is not possible to "optimize" each alternative. The analysis, however, does identify the magnitude of investment that can be supported to serve a particular ridership market, or the level of ridership that must be generated to render a required investment worthwhile.

In the case of public transportation, cost-effectiveness cannot be measured as a truly financial criterion, since a public subsidy is required, and the magnitude of the required subsidy tends to increase as the level of service increases. However, measuring the rate of subsidy or cost per rider carried on the system provides a useful way to compare alternatives and select the mix of services and investments that maximizes the effectiveness of commuter rail at any given level of cost or subsidy.

The cost effectiveness measures used in this analysis compare the ridership and cost associated with each option. The cost of a scenario, for purposes of estimating relative cost-effectiveness, is measured in one of two ways -- total capital expenditures over the 20-year horizon period, or net total investment in commuter rail system, including both capital costs and operating subsidies, over the same period. The former measure, total capital cost, presents the magnitude of the required capital investment program, expressed in current dollars. The latter, net total cost of delivering commuter rail service over the 20-year horizon period, is defined to be the sum of capital investment plus operating subsidy, where operating subsidy is defined to equal operations and maintenance costs, less revenues, over a 20-year horizon period. This measure incorporates the effects of operating costs over the long term, which are important to consider since they are incurred on a daily basis for the lifetime of the improvements and vary among the alternative scenarios. This calculation requires of discounting of the annual stream of estimated capital expenditures, O&M costs and revenues over the 20-year period to their net present value. This measure provides an estimate of the total cost of the various scenarios to regional decision-makers.

These two measures both were used to compare the three scenarios for each of the seven potential commuter rail routes and produced similar results, as shown in Appendix G. The pattern formed by the cost-effectiveness curve is the same when net total cost is used in lieu of total capital costs. Either measure is an appropriate yardstick by which to gauge the effectiveness of the potential routes. *For the sake of simplicity and clarity, capital cost was used as the principal measures of cost in the Phase II cost-effectiveness calculations*.

The cost-effectiveness curve, comparing the long range master plan alternatives, is plotted as a scatter diagram, with ridership plotted on the y-axis and capital or net cost on the x-axis (see Figure 4.4.1 which presents a schematic diagram). Each route configuration and level of service is represented by a single data point on the chart. Alternatives whose data points are situated toward the top and the left-hand edge of the graph are the most cost-effective, having the greatest level of ridership per unit of cost. Routes existing below and to the right of other alternatives are less cost-effective, though they may still prove to be feasible and may be desirable based on other non-quantifiable factors. To select a preferred service scenario for each route, a public policy choice is necessary about the level of investment that is justifiable on the basis of the incremental ridership gained. This choice will determine either the maximum practical limit of available government funds or the point at which additional riders cannot justify the incremental cost of attracting them to the railroad.

Figure 4.4.1
Cost-Effectiveness Scatter Diagram

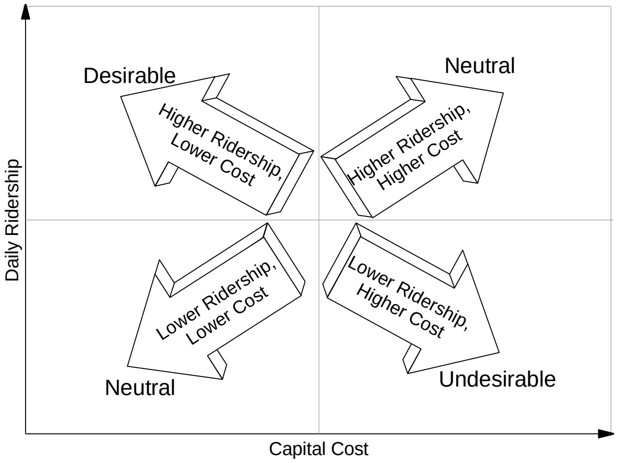

Desirable
Higher Ridership, Lower Cost
Neutral
Higher Ridership, Higher Cost
Lower Ridership, Lower Cost
Neutral
Lower Ridership, Higher Cost
Undesirable
Daily Ridership
Capital Cost

Table 4.4.1 presents the data and ratings on the relative cost-effectiveness of the seven routes as stand-alone services. Cost-effectiveness can be measured in a number of ways. Cost per trip is calculated using a formula that is similar to the formula used by FTA in its New Starts evaluations. FTA's "cost per new rider" measure is calculated by adding the annual O&M cost to an annualized capital cost, then dividing by the number of new annual riders to produce an annual cost per new rider. In the case of NEORail, all costs and passengers were assumed to be "new," and are therefore included in this calculation. Two other cost-effectiveness measures -- capital cost per mile and capital cost per passenger -- are also provided.

Table 4.4.1
Relative Cost-Effectiveness of Routes 1 Through 7

Route	1 Lake West Lorain	2 West Elyria	3C South West Medina	4 South Canton Via Hudson	5 South Canton Via Kent	6 East Aurora	7 Lake East Ashtabula
Rating	High	Low	Low	Medium	Medium	High	Medium
Data: Cost/trip	$25-34	$48-96	$46-128	$29-78	$33-122	$16-44	$31-69
Capital Cost/mile (millions)	$4-10	$8-18	$7-11	$6-10	$5-8	$5-7	$4-8
Capital Cost/trip (thousands)	$66-72	$181-239	$155-365	$81-181	$86-264	$42-91	$75-151

Figure 4.4.2 presents a sample scatter diagram showing the cost-effectiveness of these stand-alone routes in comparison to various combinations of routes and services.

Another way to look at cost effectiveness, as a single numeric measure, is to divide ridership by capital cost for each route and route combination. Figure 4.4.3 graphs this measure for several potential combinations. The combination of Routes 1 and 6 has the highest ratio of daily riders per million dollars of capital cost, among all of the combinations considered. As more routes are added to the network, the marginal cost-effectiveness declines, primarily due to the high capital costs of building the more capacity-constrained and expensive portions of the rail network. For route combinations in the $300 to $500 million range, the most cost-effective combination is achieved with Routes 1, 6 and 7. For route combinations in the $500 million to $1 billion range, the most cost-effective combination is achieved with these three routes, plus Route 4.

Figure 4.4.2
Comparative Cost-Effectiveness of Routes 1 Through 7

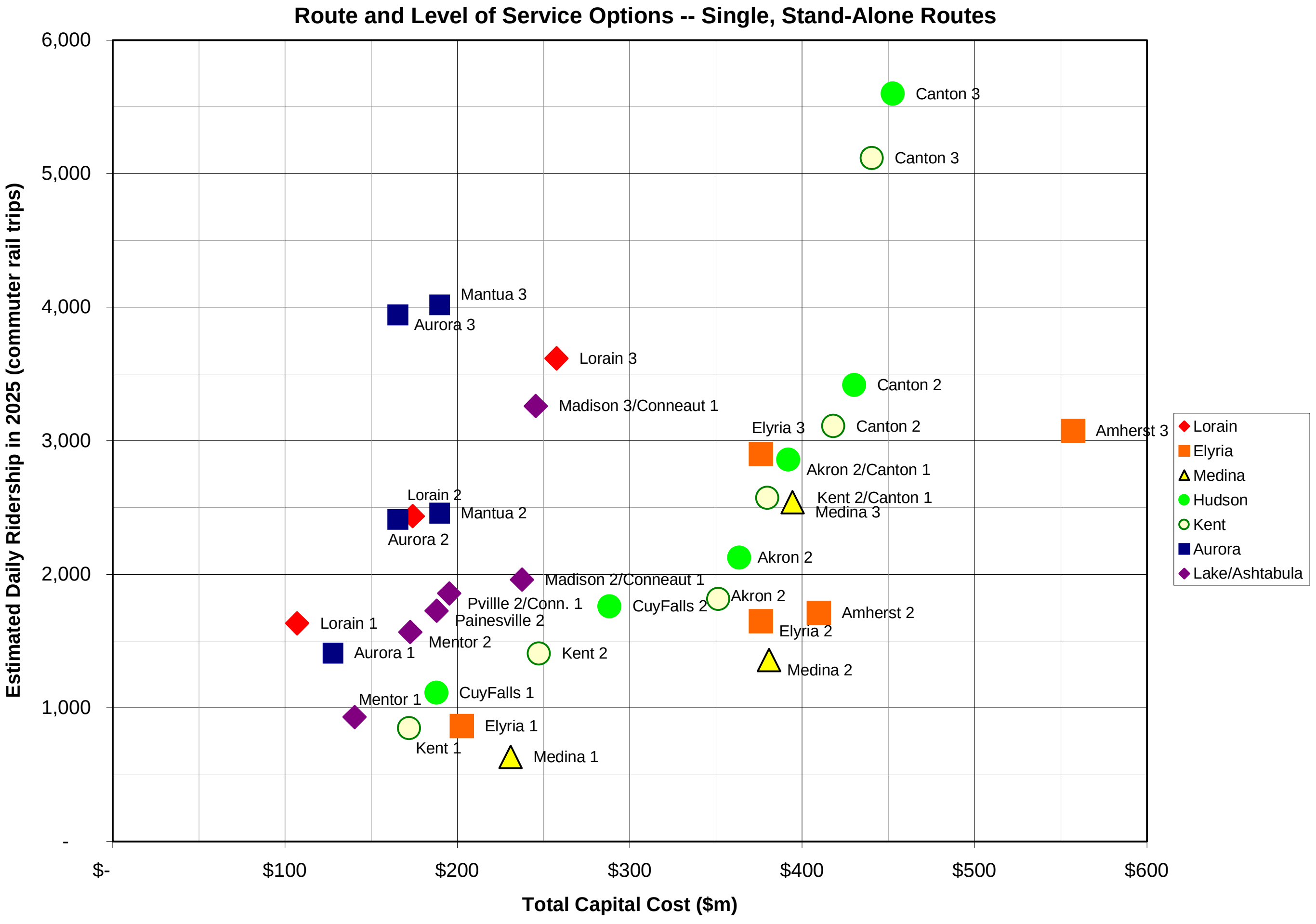
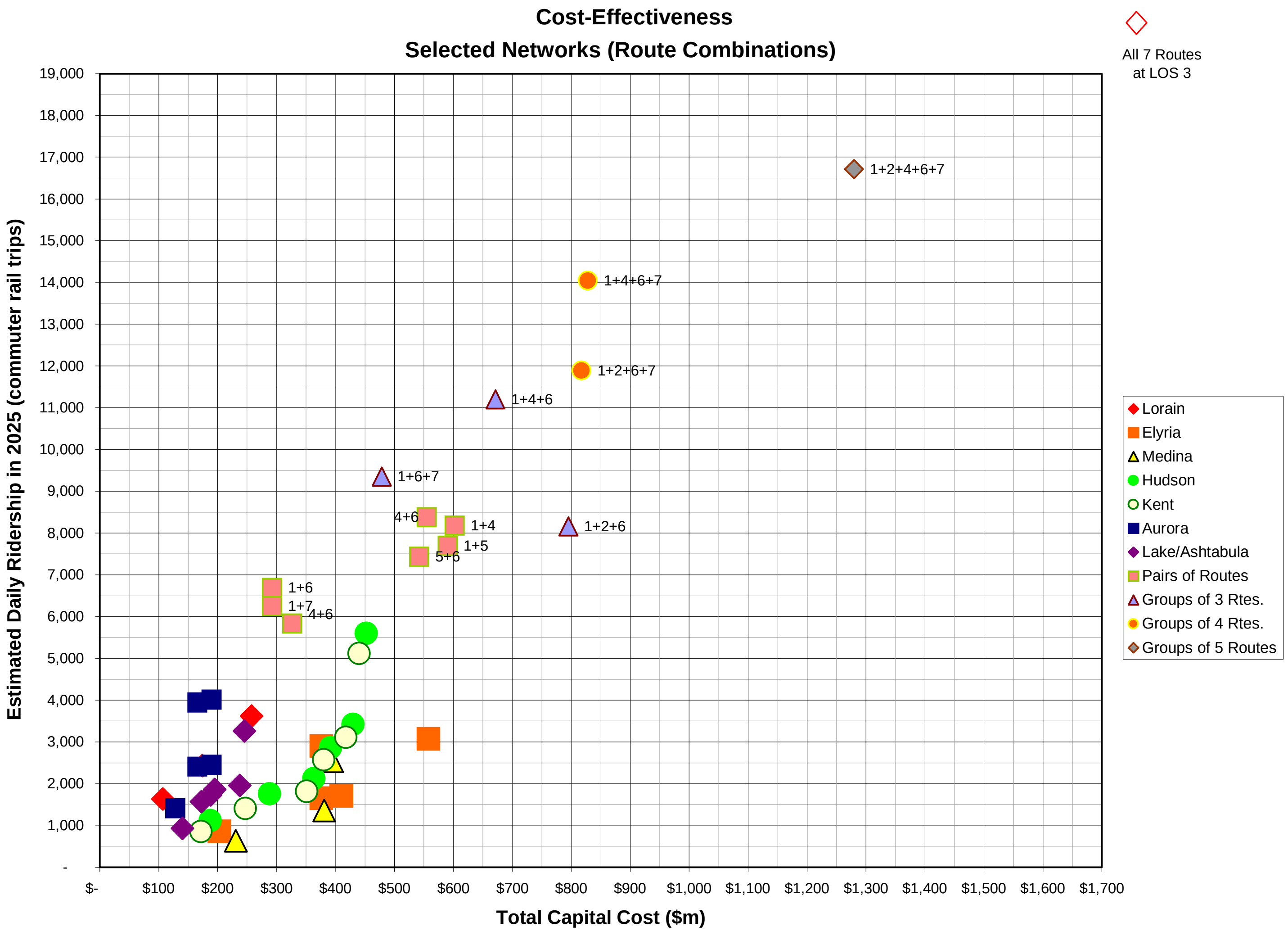


Figure 4.4.3
Comparative Cost-Effectiveness of Selected Route Combinations



4.5 EFFECTS ON RAIL FREIGHT OPERATIONS

The cooperation of the railroads that own and/or operate on that line is essential to the successful implementation of any of the commuter rail routes. Meetings with the railroads have been and will continue to be held to discuss the goals and progress of the study and the role of the railroads in achieving those goals. Key items of these discussions have included whether the freight traffic that currently operates on each of the lines would be affected by operation of commuter rail service and, if so, in what way; what upgrades, repairs and other investments are necessary to permit the operation of commuter rail with existing freight traffic; and, what entities will be providing the necessary capital investments to make these repairs and upgrades, and in what proportion. The outright purchase of existing railroad assets on the part of a governmental or private entity for the operation of commuter rail service has also been an item of discussion with the railroads that own and operate on the seven corridors.

To the extent that investment is made in parallel infrastructure (i.e., new mainline tracks) for commuter rail, separate from the existing mainline freight tracks, the major freight railroads – CSX and Norfolk Southern – are supportive of commuter rail. However, on the busy mainline freight corridors, both railroads have serious concerns about their loss of operational reliability; train dispatching flexibility and capacity for future traffic growth – to the extent that commuter trains are proposed to operate on existing heavily used tracks. Where shared use is proposed, in order to reduce capital costs and where capacity impacts can be mitigated, other benefits to the freight railroads must be found to offset the negative impacts that they will associate with the introduction of commuter rail.

Potential benefits to NS of commuter rail-related investments include:

- Increased capacity through Cleveland as a result of the proposed Erie-Nickel Plate connection and/or a new rail bridge across the Cuyahoga River
- Fuel savings due to reduced grades due to Erie- Nickel Plate connection and/or a new high-level bridge over Cuyahoga River,
- Additional mainline track available during non-commuter use hours
- Reduced maintenance, and improved ride quality resulting from elimination of crossing diamonds at Harvard, Erie Crossing
- Completion of centralized traffic control (CTC) and remote-controlled interlockings between the North Coast Transportation Center (NCTC) and Hudson, including the mainline connections to Motor Yard
- Bridge structures, embankment, track and signal & control systems brought to state of good repair and existing deficiencies addressed.

Potential benefits to CSX of commuter rail-related investments include:

- Additional mainline track, where provided, would be available for freight use during non-commuter use hours
- Creation of additional storage track capacity between Collinwood Yard and downtown Cleveland
- Upgrading/renewal of interlockings at Collinwood Yard and elsewhere, to accommodate proposed new track configurations with additional main tracks

- Potential additional capacity for CSXT movements over the lakefront route through Cleveland (via NS trackage rights), especially outside of the commuter peaks, resulting from diversion of NS through freights via Nickel Plate bridge
- Income from sale or lease of CSX-owned property at East 26th Street Yard for potential passenger yard facilities to include combination of commuter rail storage/maintenance, intercity high-speed passenger corridor service storage/maintenance, and/or Amtrak mail and express facility.
- Income from potential development on air rights or other property owned by CSX in downtown Cleveland, at or adjacent to a new downtown rail station and multi-modal hub in the vicinity of the existing Amtrak station.
- Potential track configuration improvements in Akron vicinity associated with sale of Valley Yard to Akron Metro and development of commuter rail access into Akron – including relief of civil speed restriction at Arlington Street.

These benefits were discussed with each railroad at a series of meetings and in telephone conversations, leading to the identification of recommended investments in railroad capacity, the costs of which are included in the NEORail Phase II capital cost estimates. To the extent that these investments are made prior to the initiation of commuter service, railroad cooperation can be expected for each of the NEORail corridors. However, efforts to reduce capital costs by requiring increased shared use of existing tracks can be expected to be problematic in the corridors that are heavily-used by NS and CSX main line traffic.

The Wheeling & Lake Erie Railroad generally is supportive of commuter rail on its right-of-way, where line capacity is not a significant concern. Potential benefits to the Wheeling of commuter rail-related investments include:

- Where passenger trains are to be operated, existing track and related civil and structural elements would be upgraded and brought to state of good repair, including addressing any existing deficiencies
- Extension of existing Glenwillow siding and installation of one or more new sidings, which would be available for freight use at time when passenger trains are not operating
- Upgrading of existing grade crossing protection
- Installation of signal and traffic control system, where bi-directional passenger operations are proposed
- New track connections with NS at Bedford and/or Maple Heights, enabling potential re-routing of W&LE freight trains to and from Cleveland, consistent with the railroad’s future plans.
- Elimination of the crossing diamonds at Harvard.

Table 4.5.1 below shows the relative, qualitative rating of the prospects for successful railroad coordination in each of the seven corridors, and briefly describes the improvements and investments that are likely to be necessary to achieve an agreement with the railroad that currently owns and operates the corridor. Several of the corridors, due to the heavy volume of freight traffic and the significant challenges facing the mixing of commuter and freight rail services in a single rail corridor, are deemed “problematic,” and would require major efforts to achieve a successful sharing of right-of way with the railroad operators – entailing either major investment to create a parallel track or tracks for use by commuter trains, or reaching a negotiated agreement concerning limits on the number of commuter trains using mainline freight tracks and investments elsewhere to relieve capacity bottlenecks or improve operational reliability to compensate for any localized impacts on the capacity or dispatching flexibility of rail freight service in the shared-use area.

In general, the following guidance emerged from the discussions with the railroads, particularly NS and CSX, concerning potential future development of commuter rail service in the region:

- A single point of contact with respect to passenger rail initiatives in the region is desirable for the railroads, to enable them to focus their attention productively.
- Given the relatively high investment in the greater Cleveland area associated with the acquisition of Conrail by NS and CSX, and pressing operational problems and capital needs elsewhere on their systems, it will be difficult to attract their attention to fund additional changes in Northeast Ohio.
- As a result, significant benefits – either in terms of growth capacity, improved reliability, cost savings, or payments for right-of-way acquisition – will need to be found to gain their attention and ensure timely reviews and approvals.
- In general, the railroads are interested in and open to proposals that expand or improve their operating opportunities. Because of their current financial position, they are also interested short-term initiatives that can generate cash for them (or avoid expenditures).
- When and if additional mainline tracks are added to support commuter service, the railroads generally favor integrating these tracks into the existing rail system, with common signal and control systems and interlocking configurations that support flexible track use (rather than creating a dedicated, isolated passenger railroad parallel to the freight railroad).
- The railroads will seek to apply design standards to new construction that promote worker and public safety and facilitate continued operations during periods of track outages. This may need to entail investments to widen track centers for new track construction, where this can be done cost-effectively.
- Adequate liability insurance coverage will have to be maintained by any sponsor of commuter rail service using rail freight rights-of-way, and the railroads will need to be held harmless from liability resulting from passenger operations.
- The railroads will not likely be supportive of incremental investments in commuter service that do not allow for or facilitate future major growth and expansion.

Table 4.5.1
Railroad Coordination

Route	**1 Lake West** Lorain	**2 West** Elyria	**3 South West** Medina	**4 South** Via Hudson	**5 South** Via Kent	**6 East** Aurora	**7 Lake East** Ashtabula
Rating	Medium - High	Low - Medium	Low - Medium	Medium	Medium - High	High	Low - Medium
Data	NS Main – Problematic but achievable w/ existing bridge	NS Main – Achievable w/ separate commuter track & new Cuy. River bridge.; Brook Park problematic	NS Main – Achievable w/ separate commuter track & new Cuy. River bridge; Brook Park problematic	NS Main – Achievable w/ separate commuter track to Hudson	NS Main – Achievable w/ separate commuter track to Bedford	NS Main – Achievable w/ separate commuter track to Erie crossing	CSX – Achievable w/ separate commuter track; Collinwood Yard problem
	NS Nickel Plate– Readily achievable		CSX – Readily achievable	CSX at Akron – Achievable w/ grade separation	W&LE – Readily achievable	NS Randall - Readily achievable	

Notes:

- Railroad issues are difficult to isolate for individual corridors.
- Low-cost implementation w/ minimal investment not feasible in any corridor.

4.6 LOCAL SUPPORT

In order to determine how people will react to the prospect of commuter rail service, the study team identified and interviewed local stakeholders to document their opinions, ideas, and concerns about the development of a new commuter rail system in the region, and the services it could provide to their communities. Interviews documented a range of reactions, from enthusiastic support to concern and hostility. Some communities expressed concern about the noise and traffic impacts; other stakeholders expressed concern about where the funding will come from. Many areas within the study corridor expressed great interest in the possibility of commuter rail serving their communities, and indicated their willingness to assume a share of the cost of developing and operating it. Stakeholders and residents of communities along the corridor routes continue to be involved in the process of evaluating and prioritizing the identified routes.

Along with the interviews with local stakeholders, several series of public meetings have provided the public with more information about the commuter rail system evaluated in the NEORail II study. These meetings conducted as part of both Phase I and Phase II also provided members of the public an opportunity to share their opinions about the service and to express the ways in which they believe they might benefit or suffer negative impacts as a result of its implementation. After each series of public meetings, the information obtained from interviews and public meetings was compiled, summarized and presented to the MPO Boards and Technical Advisory Committees (TACs) as input to the study decision-making process.

Table 4.6.1 below provides a qualitative rating for the level and nature of the support of stakeholders and members of the public in each of the corridors, and provides information about some of the specific positive and negative reactions in public and stakeholder comments that were received over the course of the project. This qualitative rating also takes into account the expressed financial capacity and willingness to commit public funding to financing the local portion of commuter rail development by the counties and municipal jurisdictions that lie in each of the corridors. Summarizing the nature of such support in long rail corridors traversing multiple, diverse communities, of course, requires some degree of generalization and simplification. However, significant areas of support and opposition stand out, and in several corridors significant support on the part of stakeholders and residents is one of the key strengths of the corridor, while in others, organized opposition or indifference could influence the evaluation process.

Table 4.6.1
Local Support

Route	**1 Lake West** Lorain	**2 West** Elyria	**3C South West** Medina	**4D South** via Hudson	**4E South** via Kent	**6 East** Aurora	**7 Lake East** Ashtabula
Rating	Mixed	Good	Low at this site	Mixed	Mixed	May be gaining	Good
Data	Elected officials willing to seek local share, say $ can be found. Active partnerships already in place. Opposition from Cuy Co. Westshore Com.	Elected officials voice support for CR, say they want RR station as part of downtown revitaliz. plan.	Very strong support for concept, but not at this site: RR corridor is located where dense develop't is not desired; r.o.w. is in use for other high-priority public uses.	Silver Lake, Stow: vocal & organized opposition. METRO has invested $. Summit & Portage Cys, + Kent & Hudson officials, agencies express strong support for CR concept. Employers, developers active in both say CR is a good idea, but they are skeptical abt. ridership. Historically, $ support for transit has been stronger in Summit than Portage.	Twinsburg: vocal opposition rumored. KSU strong promoter.	Strong supp't in Aurora; in Solon, w/ opposition high 2 yrs ago, traffic of 6 Flags & Geauga Lk appear to be opening door to greater receptivity. Lake Cy sees ldrshp coming from LakeTran.	Lake Cy officials positive, say ldrshp will come from LakeTran; mayors positive. Key officials in Ashta. Cy are ready to strategize for local $ particip. & high State particip.

4.7 REGIONAL GOALS

In Phase II of the NEORail Study, the seven corridors were also evaluated according to their potential for furthering regional goals. The regional goals described in NOACA's *Framework for Action 2025* were an element of the evaluation in Phase I.

Significant portions of corridors 4, 5, 6 and 7 lie outside the NOACA region, either in the AMATS or SCATS regions or in Ashtabula County, which is not part of an MPO region. Chapter 2 of this report discussed the relationships between the regional goals of the three MPO areas, indicating that the goals of the three MPO regions' transportation plans overlap significantly. All three regions, for example, promote transportation development that is environmentally sensitive, efficient, and supportive of economic development and urban core areas. However, evaluation against the regional goals as expressed in NOACA's *Framework for Action 2025* is not necessarily applicable to all the areas of the seven corridors, since these goals, as such, have not been adopted as policies by the other MPOs or by Ashtabula County.
Therefore, the CRAC developed its own goals to guide the NEORail II study process, which were drawn from the regional goals established by the three area MPOs. Though again expressed in the language of the NOACA regional goals, these goals eliminated those that might be less supported by the goals stated in the other regions' transportation plans, and/or are not applicable to an evaluation of commuter rail. The goals developed by the CRAC to consider in evaluating potential corridors are:

Goal 1: Promote Concentrated Development
Goal 2: Provide Transportation Choices
Goal 3: Support Urban Core Areas
Goal 4: Expand Access to Jobs
Goal 5: Enhance the Environment
Goal 6: Use Existing Infrastructure
Goal 7: Leverage Federal Financial Support

Table 4.7.1 provides further explanation and clarification of the goals, relating them to the regional goals identified in NOACA's *Framework for Action 2025*. These same goals, though worded differently, are reflected in the transportation goals identified in the transportation plans of AMATS and SCATS.

Table 4.7.2 presents the evaluation of each of the seven corridors in terms of how well they address these study goals. Four of the corridors received ratings of High or Medium-High:

- Route 1 – Lake West (Lorain) – was rated Medium-High. This route offers moderately high ridership potential at a relatively low cost. Accordingly, it provides one of the better opportunities to leverage Federal financial support.
- Route 4 – South via Hudson – was rated Medium-High. This route supports existing urban core areas and attracts relatively high ridership. The route also offers opportunities to promote concentrated development and enhance access to jobs. However, the route would require a very substantial capital investment.

- Route 5 – South via Kent – was rated Medium-High. Like Route 4, this route supports existing urban core areas and attracts relatively high ridership. It also can promote concentrated development and enhance job access. But the capital cost is substantial.
- Route 6 – East (Aurora) – was rated High. This route attracts medium-high ridership at a relatively low capital cost. Thus it provides a good opportunity to leverage Federal funding. Compared with the other corridors, Route 6 offers the greatest opportunity to promote concentrated development and expand access to employment/

The other three corridors received ratings of Medium and Low-Medium:

- Route 2 – West (Elyria) – was rated Medium. Compared to other corridors, ridership is Low-Medium, while costs are high.
- Route 3 – Southwest (Medina) – was rated Low-Medium. The assumed route does not serve the most developed parts of the corridor, leading to low ridership. Costs are Medium-High. County plans discourage concentrated development along the line.
- Route 7 – Lake East (Ashtabula) – was rated Medium. In relative terms, this route attracts medium levels of ridership and has a medium cost.

Table 4.7.1
NEORail Phase II Study Goals

Promote Concentrated Development	Direct the plan and its investment toward efficient, compact land use development/redevelopment that facilitates accessibility, saves infrastructure costs, preserves and enhances farm land, forests and open space and enhances the economic viability of existing communities in the region. (Goal 9: Framework for Action 2025)
Provide Transportation Choices	Establish a more balanced transportation system which enhances modal choices by prioritizing goods movement, transit, rail, pedestrian and bicycle travel instead of just single occupancy vehicle movement and highways. (Goal 4: Framework for Action 2025)
Support Urban Core Areas	Foster reinvestment in existing urban core areas throughout the region, and work to target and manage transportation investments to implement Plan goals. (Goal 7: Framework for Action 2025)
Expand Access to Jobs	Improve the transportation mobility of the transit-dependent and low income individuals to jobs, housing and other trip purposes. (Goal 5: Framework for Action 2025)
Enhance the Environment	By improving air, land and water quality, and by identifying and preserving existing critical natural resources and environmentally sensitive areas. (Goal 2: Framework for Action 2025)
Use Existing Infrastructure	Preserve and improve the efficiency of the existing transportation system, prioritizing elements of the system identified as significant. (Goal 3: Framework for Action 2025)
Leverage Federal Financial Support	Comply with requirements for maximum Federal funding of recommended improvements.

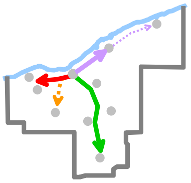


Table 4.7.2
Corridor Performance With Respect to Regional Goals

	1 Lake West Lorain	2 West Elyria	3C South West Medina	4 South Via Hudson	5 South Via Kent	6 East Aurora	7 Lake East Ashtabula
Summary of All Goals	**Medium - High** Moderately high ridership, relatively low cost, has support of local communities	**Medium** Moderately high ridership but relatively high capital costs due to technical issues; supported by local communities	**Low - Medium** Lower ridership, moderate cost, rapidly developing corridor, but alignment is not supported for development by Medina County	**Medium - High** Higher ridership, moderate-to-high capital cost; high operating cost, significant technical issues; mixed local support	**Medium - High** Higher ridership, moderate-to-high capital cost; high operating cost, significant technical issues; mixed local support	**High** Higher ridership; low capital cost; strong local support	**Medium** Moderate ridership but high capital costs due to technical issues; supported by local communities
Promote Concentrated Development	**Medium - High** Serves higher density areas; local areas committed to development around stations	**Medium**	**Low** Medina County's land use plan discourages development in this alignment	**Medium - High** Some stations serve higher density areas; some local commitment to focus development in station areas	**Medium - High** Some stations serve higher density areas; some local commitment to focus development in station areas	**High** Corridor does not extend beyond developed areas; stations serve medium and higher density areas; local commitment to focus development in station areas	**Medium**
Provide Transportation Choices	**Low - Medium** Commuter Rail would add new mode, but parallel express bus service exists in Cuyahoga County	**Medium**	**Medium**	**Medium**	**Medium**	**Medium**	**Low - Medium** Commuter Rail would add new mode, but parallel express bus service exists in Lake and Cuyahoga Counties
Support Urban Core Areas	**Medium - High** Serves Cleveland and Lorain CBDs	**Medium**	**Medium**	**Medium - High** Serves Cleveland, Akron and Canton CBDs	**Medium - High** Serves Cleveland, Akron and Canton CBDs	**Medium**	**Medium**
Expand Access to Jobs	**Low - Medium** Little service to lower-income Cleveland neighborhoods; suburban stations distant from employment centers	**Medium - High** Ridership estimates show relatively high reverse-commute ridership. High employment around station areas	**Low - Medium** Suburban stations relatively distant from growing employment centers	**Medium - High** Connects lower income neighborhoods in Cleveland, Akron and Canton to suburban employment centers	**Medium - High** Connects lower income neighborhoods in Cleveland, Akron and Canton to suburban employment centers	**High** Connects lower income neighborhoods in Cleveland to large, growing suburban employment centers	**Medium**
Enhance the Environment	**Medium - High** Moderately high ridership; low impact to undeveloped areas	**Low - Medium** Low-to-medium ridership	**Low - Medium** Low ridership; serves less developed areas	**Medium - High** High ridership; low impact to undeveloped areas	**Medium - High** High ridership; low impact to undeveloped areas	**Medium - High** High ridership; low impact to undeveloped areas	**Medium**
Use Existing Infrastructure	**Medium**	**Low - Medium** Additional rail right-of-way and improvements to Cuyahoga River bridge	**Low - Medium** Additional rail right-of-way and improvements to Cuyahoga River bridge	**Medium**	**Medium**	**Medium**	**Low - Medium** Issues related to Collinwood Rail Yard
Leverage Federal Financial Support	**High** High ridership relative to cost; strong local financial support and land use commitment	**Medium - High** Strong local financial and land use support, but relatively low ridership compared to cost	**Low - Medium** Relatively little local support for commuter rail in this alignment; relatively low ridership compared to cost	**Medium** Higher ridership relative to cost, but local development and financial commitment mixed	**Medium** higher ridership relative to cost, but local development and financial commitment mixed	**High** higher ridership relative to cost; strong local support	**Medium - High** Moderate ridership relative to cost; favorable local support

4.8 RESULTS

Table 4.8.1 provides a high-level summary of the evaluation described in this chapter. While many important details are not evident in this summary, the overall tendencies are revealing.

The best opportunities for commuter rail are those that do relatively well on all of the criteria – that are likely to attract relatively high ridership at relatively low cost, that enjoy community support, that are likely to attract the support of freight railroads, and that help the region to meet its adopted goals. In this regard, four of the seven routes have ratings of medium or better on all of the evaluation criteria, indicating that they are the best candidates for initial implementation of commuter rail:

- Route 1 – Lake West (Lorain)
- Route 4 – South via Hudson
- Route 5 – South via Kent
- Route 6 – East (Aurora)

Of these four corridors, Route 1 and Route 6 stand out for having “High” ratings on cost effectiveness, Medium-High or High ratings on railroad cooperation, and Medium-High or High ratings on regional goals achievement.

All of these factors were considered by the study team and the CRAC in developing the tiering recommendations discussed in detail in Chapter 5.

Table 4.8.1
Summary of Evaluation Results

	1 Lake West Lorain	2 West Elyria	3C South West Medina	4 South Via Hudson	5 South Via Kent	6 East Aurora	7 Lake East Ashtabula
Effectiveness (ridership)	Medium-High	Low-Medium	Low	High	High	Medium-High	Medium
Capital Cost	Low Cost	High Cost	Medium-High Cost	Medium-High Cost	Medium-High Cost	Low Cost	Medium Cost
O&M Cost	Medium Cost	Medium Cost	Medium Cost	Medium-High Cost	Medium-High Cost	Medium Cost	Medium-High Cost
Cost-effectiveness	High	Low	Low	Medium	Medium	High	Medium
Railroad cooperation	Medium-High	Low-Medium	Low-Medium	Medium	Medium-High	High	Low-Medium
Development potential	Medium	High	Low	High	High	Medium	Low-Medium
Regional goals	Medium-High	Medium	Low-Medium	Medium-High	Medium-High	High	Medium
Local support: (political, financial)	Mixed	Good	Low at this site	Mixed	Mixed	May be gaining	Good

Chapter 5: Recommended Phasing

5.1 Combining Routes

5.2 Target Network and Tiering Recommendation

5.3 Summary of Public Meetings

5.4 Tiering Decisions

CHAPTER 5 - RECOMMENDED PHASING

5.1 COMBINING ROUTES

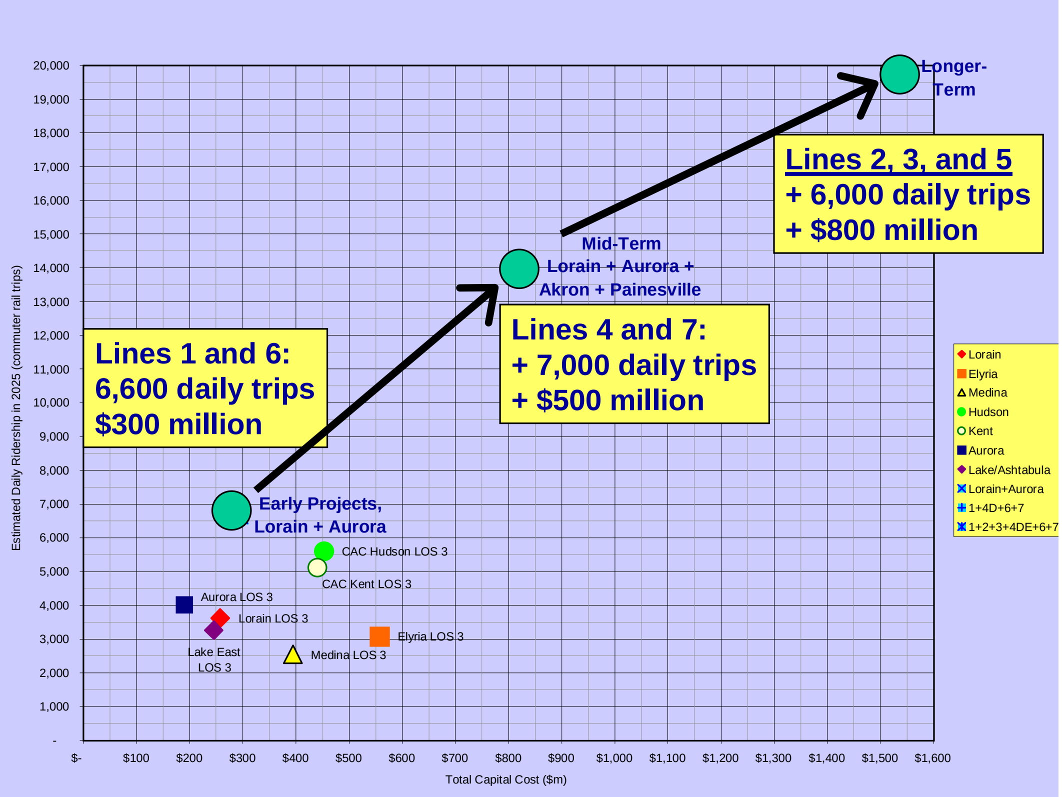
To be feasible and justifiable, investments in commuter rail must be cost-effective, from a public transit perspective, generating ridership and other benefits commensurate with the cost. In Northeast Ohio, the size and extent of the network affects its overall cost-effectiveness. Implementation of an extensive commuter rail network with multiple branch lines increases the potential for rail to serve trips across or through the city center, and to help achieve regional development and mobility goals. Moreover, by combining routes the region can achieve economies of scale by spreading fixed costs – such as station and track improvements in downtown Cleveland – over a larger ridership base. The point of diminishing returns can also be reached, however. In parallel corridors that compete for the same riders and where implementation difficulties or right-of-way constraints considerably raise the incremental capital cost, service may not be warranted. Recognizing the overall high cost of implementing any commuter rail service and the, limited financial resources of this (or any) region strongly suggests a phased approach to implementation.

Chapter 4 presented a comparison of the seven corridors, each as a stand-alone project and in various combinations. To evaluate the incremental benefits of combining routes, the total capital costs and total daily system ridership were compared for each of the various combinations of routes. This analysis showed that a system comprising both Routes 1 and 6 would achieve the best cost effectiveness rating. The next highest ratings would be achieved by adding to this system one or both of Routes 4 and 7.

The outcome of this analysis is illustrated in Figure 5.1, in which the benefits (measured in terms of riders) are plotted on the vertical axis and the capital costs is plotted on the horizontal axis. Each individual line is shown as a dot representing its particular cost and ridership characteristics. Dots further to the left and higher represent those that are the most cost effective. The combination of Routes 1 and 6, shown by the larger blue dot at the lower left side of the graph, attracts more riders at less cost than most of the individual lines. As commuter rail routes are added, represented by the other light blue dots, the benefits increase, but the incremental costs grow more rapidly.

By looking at the lines in combination, NEORail II also found that, to some degree, Routes 4 and 5 compete for the same markets. Over 50 percent of the alignments of route 4 and 5 overlap. While Routes 4 and 5 individually are projected to attract 5,100 – 5,600 riders per day, the two routes running simultaneously attract only a total of 6,300 riders per day. This suggests that one route or the other, but not both, should be selected for initial implementation. This situation also exists with Routes 5 and 6.

Figure 5.1
Costs and Benefits of Commuter Rail Routing Combinations



5.2 TARGET NETWORK AND TIERING RECOMMENDATIONS

In January 2001, the Commuter Rail Advisory Committee (CRAC) conducted an all-day workshop to consider the costs and benefits of the seven potential commuter rail corridors, both individually and in combination. The outcome of that workshop was a recommended "tiering" or phasing for commuter rail, in the event that the region decides to continue with planning and developing a commuter rail system. The seven corridors were prioritized into three categories – Early-Term Projects, Mid-Term Projects, and Long-Term Projects. The routes that were assigned to each phasing category, as well as the associated level of service, are described in the following sections.

On a technical basis, the commuter rail network in the Northeast Ohio region that best meets the region's transportation goals, within acceptable levels of cost effectiveness (dollars spent per rider), and before reaching the point of diminishing returns on increased service, contains the four routes identified in the Early and Mid-Term categories. These are:

Early-Term

- Line 1 (Lake West Corridor) from Cleveland to Lorain, at LOS 2 (6 daily round trips)
- Line 6 (East Corridor) from Cleveland to Aurora at LOS 3 (12 daily round trips), with extended peak service to Mantua at LOS 1 (3 peak period, peak-direction trains),

Mid-Term

- Line 4 (South Corridor) from Cleveland to Akron to Canton, at LOS 3 (12 daily round trips) to Akron via the Hudson alignment, reduced service in Akron-Canton segment, and connecting bus service to the rail line from the Streetsboro-Kent corridor, and
- Line 7 (Lake East) to Painesville at LOS 3 (12 daily round trips), with extended peak service to Ashtabula County at LOS 1 (2-3 peak period, peak-direction trains).

These four lines might be viewed as the ideal “Target Network” should the Northeast Ohio region decide to pursue the implementation of commuter rail.

It is important to note that the CRAC considers its recommendation to be strictly a technical one. Other factors – such as the ability of a project sponsor in one or more corridors to secure funding – may ultimately lead to a different implementation sequence.

5.2.1 Early-Term Projects

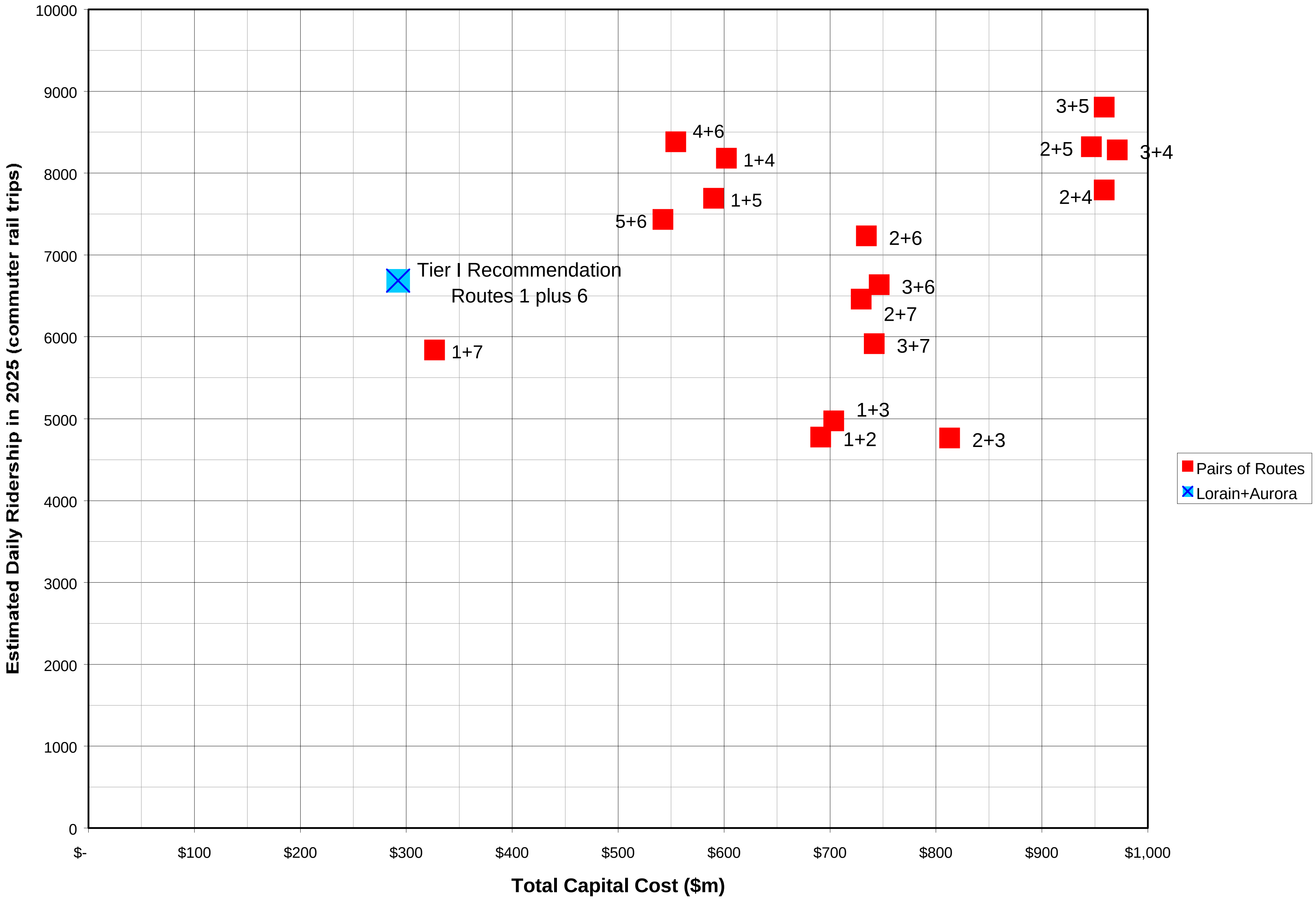
The recommended initial tier of investment and service includes two routes:

- Route 1 from Cleveland to Lorain, at LOS 2,
- Route 6 from Cleveland to Aurora/Mantua, at Level of Service (LOS) 3.

This combination offers the best opportunity for early success. First, It is the most cost-effective of all the combinations of routes and services examined in the study, in terms of riders attracted to the service for the dollars expended to create the service (See Figure 5.2.1). Second, It should be possible to implement this service in a reasonable amount of time, given that Norfolk Southern (NS) is the only freight railroad materially affected, the proposed plan offers significant capacity and cost-savings benefits to NS to compensate for the use of its right-of-way, and the proposed alignment results in minimal interference of commuter trains with freight operations. Finally, It provides early service to both the east and west sides of the region.

Figure 5.2
Relative Cost-Effectiveness of NEORail Routes and Route Combinations

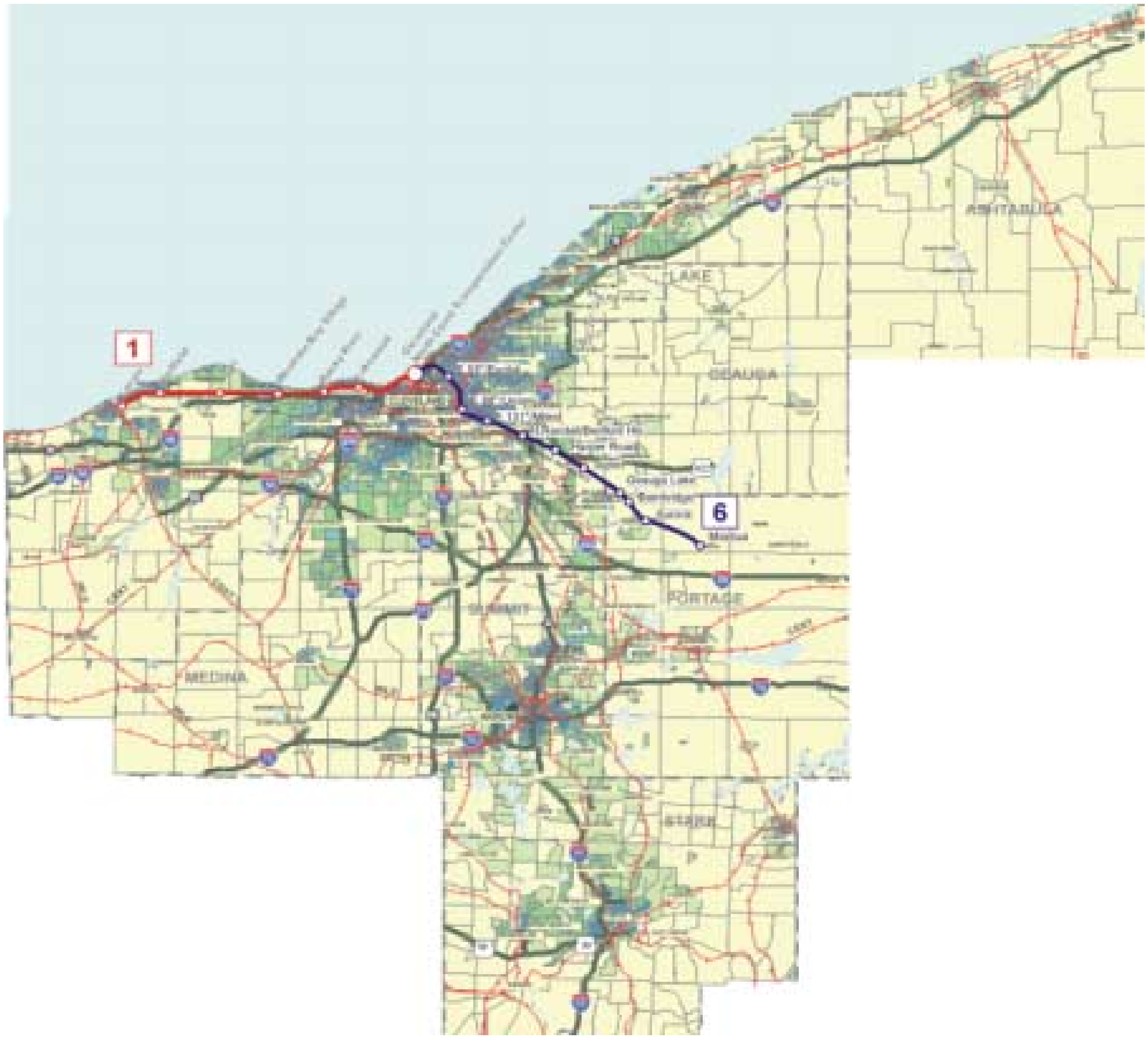
(Draft attached on the following page)


Estimated Daily Ridership in 2025 (commuter rail trips)
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
$-
$100
$200
$300
$400
$500
$600
$700
$800
$900
$1,000
Total Capital Cost ($m)
Tier I Recommendation
Routes 1 plus 6
1+7
4+6
1+4
1+5
5+6
2+6
3+6
2+7
3+7
1+3
1+2
2+3
3+5
2+5
3+4
2+4
🟥 Pairs of Routes
☒ Lorain+Aurora

This tier combines the two routes with the highest individual cost-effectiveness. The Early-Term routes will generate an estimated 6,600 daily commuter rail trips and will cost approximately $300 million to fully implement. (The cost will increase, if rail right-of-way is acquired from NS as part of the commuter rail investment plan.)

Figure 5.3

Early-Term Projects



Commuter rail service will initially be provided on two of the region's rail freight lines that have available capacity for passenger trains. On the outer portions of these lines, relatively little new track construction will be required, keeping costs lower than on other corridors.

These also are the two routes that have the fewest potential obstacles to implementation, which should enable service to be started sooner than on other lines.

On the Aurora route, construction of a third mainline track is assumed along the NS mainline for approximately six miles – from the NCTC (downtown Cleveland) to Erie Crossing (near the proposed E.88th/Union station). Once this track is built, full service at LOS 3 can be provided on this line with 3 trainsets and relatively few additional investments.

To free up sufficient line capacity across the Cuyahoga River to support up to 12 commuter trains per day on the Lorain route, construction of the Erie-Nickel Plate connection is assumed (as described in Chapter 3). A new lift bridge is assumed *not* to be required in the Early-Term projects, as long as the level of service to Lorain is capped at approximately 12 daily trains (i.e., LOS 2). Expansion of service above this level (as provided for in the long-term projects) is assumed to trigger construction of a parallel lift bridge across the Cuyahoga River.

There are several reasons for selecting two routes as Early-Term projects instead of a smaller starter system. The two routes attract at least 60 percent more ridership than either Route 1 or Route 6 individually. The Route 1 and 6 combination is more cost-effective than any stand-alone option or any other combination of two routes (as shown in figure 5.2.1). The combination provides more critical mass for use of new common station and terminal facilities in downtown Cleveland. It provides substantive benefit to Norfolk Southern (NS) freight operations, improving likelihood of reaching favorable negotiated agreement with NS. Finally, this combination balances the regional benefits of commuter rail by offering initial service to both the east side and west side of Cleveland.

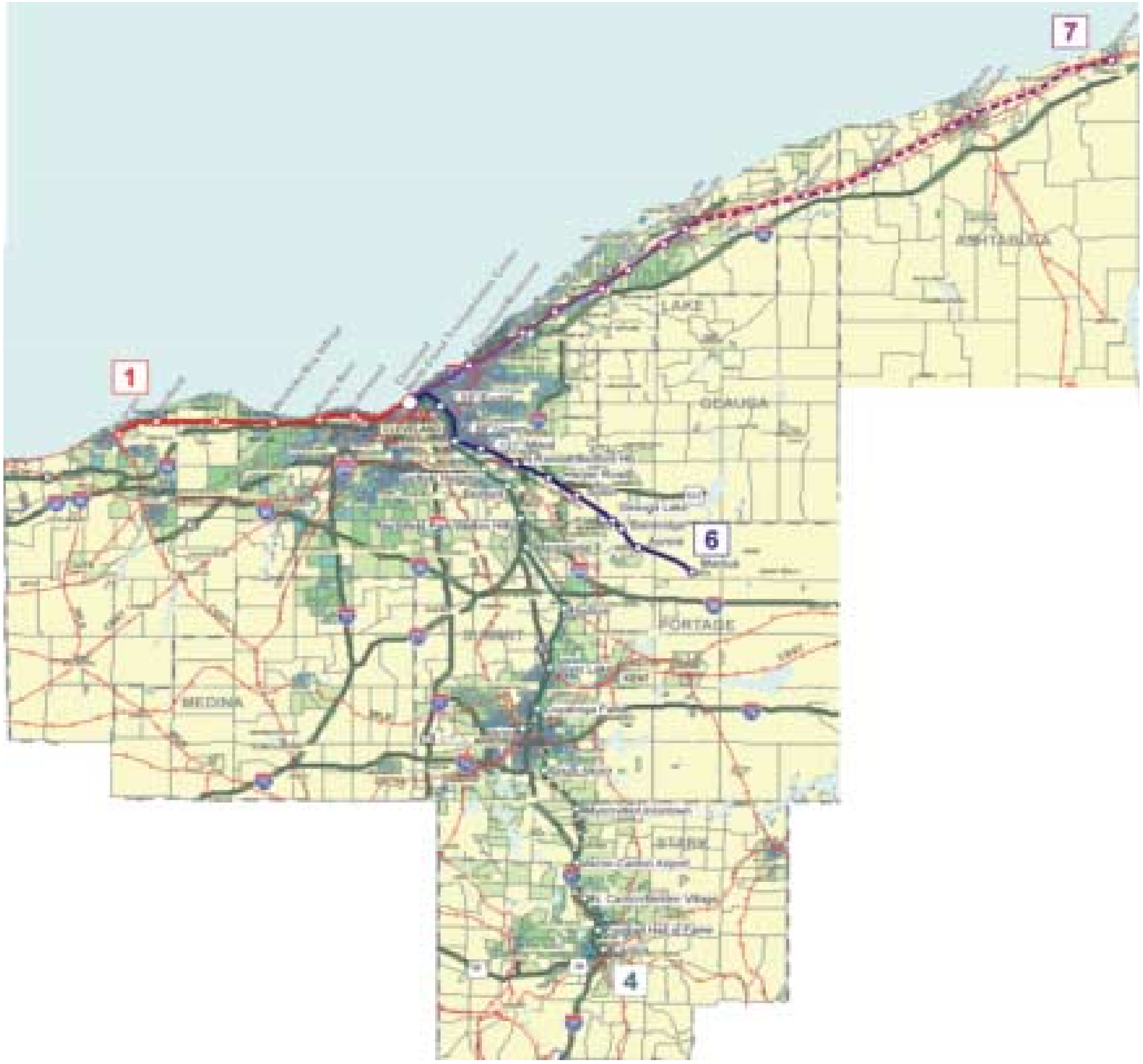
5.2.2 Mid-Term Projects

Extension of the commuter rail network into the South and Lake East corridors should proceed as soon as practicable, so that the benefits of a regional rail network can be realized as soon as possible and have the greatest opportunity to effect regional development goals. The implementation process can proceed largely independently in each corridor, since they are physically separate from one another and have distinct geographic and political constituencies. The Mid-Term projects are:

- Route 4 to Canton and Akron via Hudson at LOS 3 to Akron and LOS 1 between Akron and Canton
- Route 7 to Painesville at LOS 3, with less frequent service east to Ashtabula

These Mid-term routes will increase daily ridership from 6,600 to almost 14,000 daily trips, at an incremental cost of approximately $530 million. The financial plan contained in Chapter 6 suggests a parallel and overlapping schedule for completion of both the Early and Mid-Term projects.

Figure 5.4
Mid-Term Projects



Development of one or both of these routes could proceed simultaneously with implementation of the recommended Early-Term projects, provided local support can be garnered, sufficient funding is made available and agreements can be negotiated with the rail right-of-way owners.

In the Lake East Corridor, creation of a third mainline track through the Collinwood Yard area is assumed to be a prerequisite for commuter service on Route 7. The bulk of projected ridership demand in this corridor is generated by the communities and employment sites between Cleveland and Painesville. Therefore, investment in additional line capacity beyond this point is not cost-effective. However, limited peak-period, peak-direction service may be possible beyond this point to Ashtabula County (e.g., 2 or 3 daily trains in each direction – LOS 1), subject to negotiation with CSX.

In the NEORail South Corridor, also referred to as the Canton-Akron-Cleveland (CAC) Corridor, the determination of the recommended routing, extent and level of service for any commuter rail service is the responsibility of the CAC Major Investment Study (MIS). The NEORail Study, however, is tasked with identifying any potential regional network effects on the relative cost-effectiveness, feasibility and practicality of commuter rail service on the potential CAC routes. When compared as alternative stand-alone services, Routes 4 and 5 are not significantly different in terms of either daily ridership or capital cost. Operating costs also are similar. However, when the CAC corridor is considered as an add-on to a pre-existing network that includes service on Route 6 in the in the Southeast (Cleveland-Aurora) Corridor, Route 4 is shown to retain a higher share of its riders than Route 5. This is largely due to the fact that it is situated farther away from the East Corridor communities than Route 5. Ridership demand from Kent, Streetsboro, Twinsburg and Aurora will be divided between the two corridors. Consequently, the combination of Routes 6 and 4 appear to offer the best geographic coverage of the south and east corridors and the highest ridership potential. All communities in these corridors with substantial numbers of person-trips to Cleveland and Akron are reasonably well served by this combination of rail routes, with the exception of Streetsboro and Kent. The Mid-Term projects, therefore, assume that improved line haul bus service and/or feeder bus service connecting with the rail line(s) will be provided from both Streetsboro and Kent, and in fact are being considered as part of the MIS alternatives evaluation.

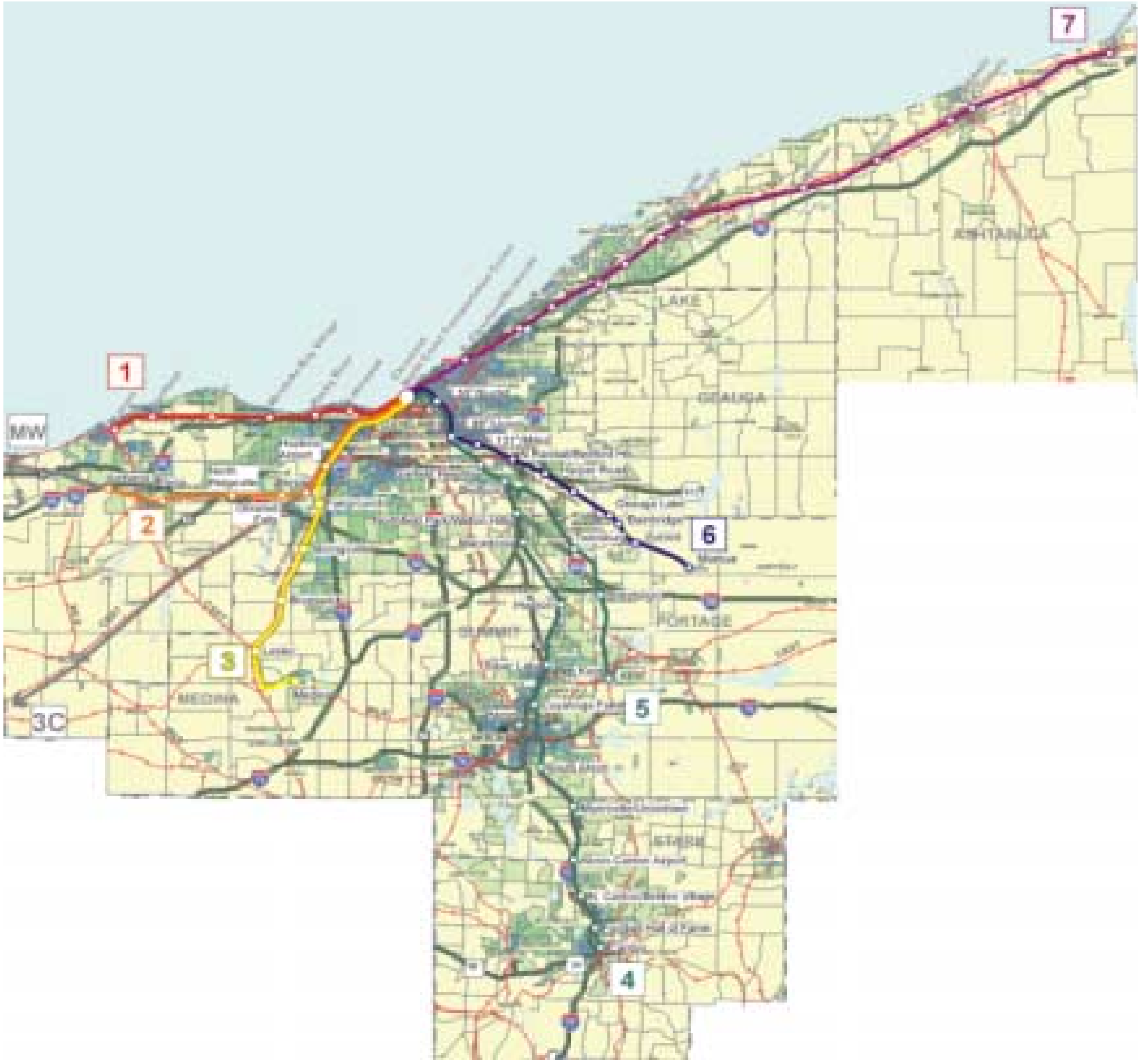
Full ridership benefits in this corridor, with commuter service to both the Cleveland and Akron CBDs, will be reached only at LOS 3, and thus is the recommended service level. NS is likely to require provision of a third main track for the entire territory where commuter trains follow the NS mainline. This corridor, therefore, has both high potential ridership and a high price tag. It may be possible to implement service in this corridor in stages – initially at LOS 2 – at a lower level of initial investment. Such a scenario would provide partial triple-tracking of the NS mainline as required to support LOS 2, subject to negotiated agreement with NS (or full triple-tracking and grade-separation with LOS 3 if agreement cannot be reached).

Following initial implementation of the Early-Term projects routes, the Mid-Term extensions can proceed largely independent of one another and at their own pace, depending upon the level of local funding and political support and the ability to negotiate capital investment, access and operating agreements with CSX and NS. The incremental cost-effectiveness (i.e., daily riders added per dollar of capital investment) of adding Route 7 to the Early-Term network is approximately the same as adding Route 4.

5.2.3 Long-Term Projects

Beyond the Mid-Term projects, additional extensions and expansions of commuter rail service tend to face diminishing returns – lower incremental commuter rail ridership at higher incremental costs. However, there are a number of additional investments in rail service that could continue to generate significant increases in daily ridership beyond the Mid-Term level and better support the regional development and mobility goals that are enumerated among the study's evaluation criteria.

Figure 5.5
Long-Term Projects



Most prominent among these is a plan to provide a major increase in the capacity of the NS Chicago mainline heading westward from Cleveland, starting at the Cuyahoga River lift bridge and running all the way past Berea. High levels of current and projected freight traffic, coupled with the operational bottleneck that exists in Brook Park at the west end of Rockport Yard, effectively preclude the addition of significant numbers of passenger (or freight) trains through this area. The cost per mile for adding track in this area is high relative to elsewhere in the region, due to restricted right-of-way width and multiple overhead and undergrade bridges. No single passenger service is likely to be able to justify the large expenditures that are required to improve rail access to the west of Cleveland.

However, the combination of commuter rail service in the Elyria and/or Medina corridors, plus the two potential intercity high-speed corridors that follow the same alignment (the Mid-West Regional Railroad Initiative (MWRRI) corridor to Toledo and Chicago and the 3-C Corridor to Columbus and Cincinnati), together may be able to support investment in a high-quality, 2-track dedicated passenger line, parallel to the existing freight line, in this corridor. Key elements of this west side “grand plan” include:

- New lift bridge across the Cuyahoga River, parallel to existing span (as described in Chapter 3)
- 4-track mainline (2 freight mains, 2 passenger mains) from Cuyahoga River to North Ridgeville
- Diversion of the 2 main passenger tracks through the Hopkins International Airport passenger terminal area, with a new commuter and intercity rail station and intermodal transportation center at the air terminal, providing improved regional public transportation accessibility to the Airport
- Reconstructed Berea interlocking, with a commuter station and additional tracks through the inside of the interlocking, maintaining full grade separation of Front Street near downtown Berea.

Increased transportation capacity across the Cuyahoga River, by means of a new lift bridge or bridges, will benefit multiple constituencies – rail freight, commuter and intercity rail, vehicular access to Port of Cleveland, and bicycle/pedestrian access across the river. The full cost of these improvements may not need to be borne by the commuter rail system, though this analysis attempts to document full costs and has not allocated costs to other potential funders.

To the extent that the Erie-Nickel Plate Connection proves to be successful in diverting NS traffic away from the lakefront, it may be feasible to reduce the scope of construction in the Alcott to Brook Park segment to a 3-track mainline, saving significant capital expenditures on bridge reconstruction.

The infrastructure projects listed above will minimize passenger train interference with freight traffic and benefit travelers and regional stakeholders beyond commuter rail. In particular, the following passenger-related services could run on dedicated passenger tracks:

- Route 2 from Cleveland to Hopkins International Airport (serving air travelers and airport employees) and Elyria, at LOS 3
- Route 3 from Cleveland to Hopkins Airport and Medina, at LOS 3, provided that future growth patterns and policies in Medina County change to support passenger rail in the CSX Medina corridor.
- Intercity high-speed service from Cleveland to Toledo/Chicago and Columbus/Cincinnati, also serving the airport.

Intercity high-speed rail and the airport are considered to be potential funding partners. The feasibility of such a plan, and the timing of investment, depends upon decision-making and action by these other stakeholders. In the context of NEORail, the high initial capital cost in this corridor makes it a poor candidate for early implementation, and, as a result, it is shown in Long-Term projects category.

Additional elements of the rail network that are potential candidates for Long-Term projects – generating significant increases in rail ridership but at substantial cost – include:

- Route 7, extension of 3rd track and increased service beyond Painesville, as warranted by future development and traffic growth
- Route 4, increased service frequency in the CAC corridor via the NS Cleveland Line and Hudson, with capacity investments beyond those provided in the Mid-Term projects
- Bi-directional service and increased service frequency on the Akron-Canton line, requiring signal system and capacity improvements
- Route 5, peak-period, peak-direction service to Cleveland from Kent, Streetsboro and Twinsburg via the W&LE.

The full Long-Term network of all seven lines has the potential to carry upwards of 20,000 daily trips, but the total capital cost to generate this level of ridership is almost $700 million greater than that required to build the Mid-Term network.

5.2.4 Tiering Summary

A phased approach to commuter rail implementation in Northeast Ohio is prudent, practical, and promising.

- Prudent – Because extremely high cost improvements are avoided in the early years;
- Practical – Because scale economies of route combinations are realized early on, and strategic investments are made to improve rail freight capacity and reliability
- Promising – Because subsequent phases will add value and further promote regional goals as funding becomes available.

Table 5.1 summarizes the incremental costs and ridership benefits of the three tiers or phases. As shown, the Early-Term projects have the lowest cost and the highest projected ridership

Table 5.1
Costs and Ridership of Phases

	Projected Average Weekday Ridership in 2025	Capital Cost (Million 2000 $)	O&M Cost (Million 2000 $)	O&M Subsidy (Million 2000 $)
Early-Term	7000	$296	$10.5	$7.1
Mid-Term	7000	$547	$21.1	$16.5
Early-Term plus Mid-Term	14,000	$843	$31.6	$23.6
Long-Term	6000	$757	$18.8	$15.7
All Three Tiers	20,000	$1,600	$50.4	$39.3

SOURCE: Parsons Brinckerhoff

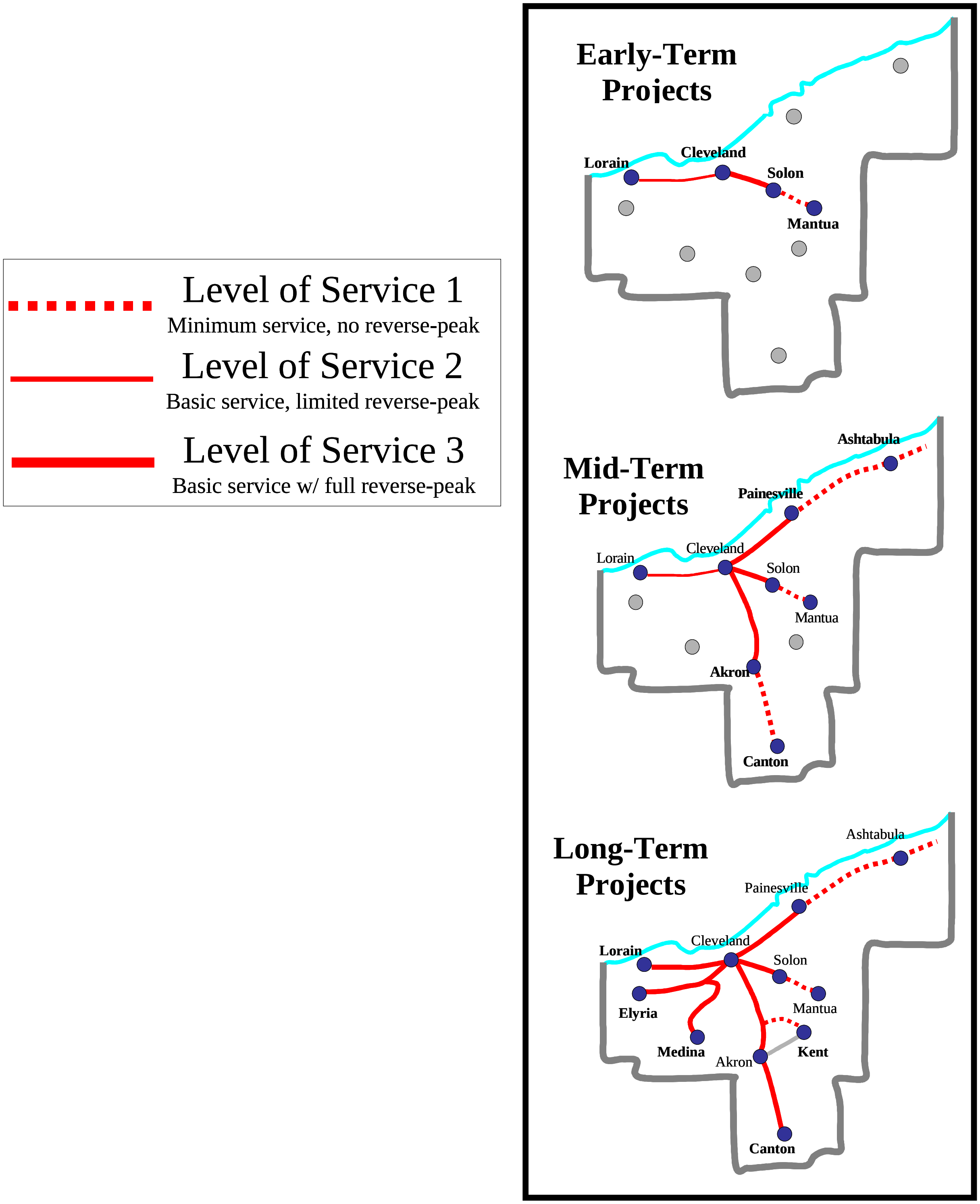
5.2.5 CRAC Recommendations

In January of 2001, the Commuter Rail Advisory Committee (CRAC) adopted recommendations regarding the phasing of commuter rail. Briefly, based on a technical evaluation of the corridors, the CRAC grouped the seven NEORail II corridors into three categories or priorities for advancement – Early-Term, Mid-Term, and Long-Term – as shown below. The CRAC considered the four Early-Term and Mid-Term corridors to be a reasonable commuter rail system for the region to aspire to over time, and the Early-Term corridors to be a logical first step, considering their costs, benefits, and ease of implementation. The CRAC's phasing recommendation was endorsed by the NOACA Board on April 11, 2001.

This phasing plan does not necessarily guide the schedule for commuter rail implementation. Subsequent policy decisions and other events, such as the availability of funding or right-of-way, may alter this phasing at some time in the future. However, the subsequent analyses of finance and governance options in this study has concentrated on a four-corridor system consisting of the Early-Term and Mid-Term corridors.

In general, the CRAC recommended that commuter rail continue to advance in the planning process of all the local MPOs and that the public should remain informed about the status of implementation. Further analysis was recommended for the potential commuter rail corridors and station locations. (See list of recommendations on page 5-21)

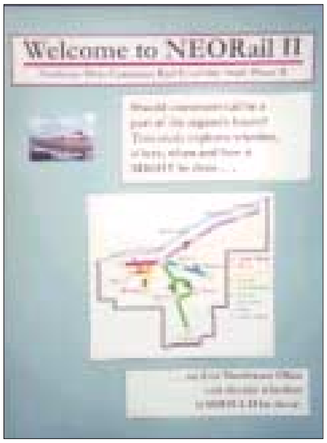
Figure 5.6
Northeast Ohio Commuter Rail System Phasing



5.3 SUMMARY OF PUBLIC MEETINGS

During February 2001, nine public meetings were held to obtain public comment on the CRAC's tiering recommendations. The meetings were held in each of the seven NEORail corridors at the following locations: Aurora, Twinsburg, Kent, Hudson, Bay Village, Lorain, Medina, Mentor, and Canton. For each of the public meetings in the various corridors, one-page handouts were developed and distributed to the public (included in AppendixB).

Large display boards were created for the presentations to the public. These boards described the overall study process, the recommendations of the study team and CRAC, and showed examples and photos of various aspects of a commuter rail project. Attendees at the public meetings were encourage to review the boards before and after the meeting and ask questions during the Q&A, or submit written comments and/or suggestions at the end of the meeting. A formal presentation was given at the meeting to explain what had been completed at this point in the study as well as to explain the next steps in the process.



5.3.1 General Findings/Implementation Phasing

The overall tone of the meetings reflected a community interest in the potential for a regional commuter rail transportation system in Northeast Ohio, but a certain amount of skepticism about levels of local support for implementation and operation costs. The strongest negative reactions to the prospect of commuter rail service were generally attributable to attendees who reside in close proximity to the railroad right-of-way.

An introduction by NOACA staff (in eight of the nine meetings, project manager Steve Jones; in the Bay Village meeting, Executive Director Howard Maier) was followed by a brief presentation (usually 20 minutes) by consulting team members Foster Nichols and/or Don Emerson). The presentation touched on what has happened in the study to date, but focused primarily on the recommended tiering or implementation phasing concept. Most of the meeting was reserved for attendees' questions and comments, which were recorded, paraphrased, by consulting team member Genevieve Ray. People were also invited to submit written comments, and many did.

Where attendees were positive or neutral about commuter rail, they supported or expressed no opposition to the proposed phasing plan. Attendees did question the need for an Aurora-Mantua connection, which was different from the original recommendation made by the consultants.

In comparison to earlier rounds of public meetings, attendees' questions and comments were more directed to the details of operations and to potential impacts of rail. Opposition to commuter rail was generally site specific, although general comments linking costs and ridership figures were not uncommon. In meetings where opposition to rail was vocally expressed by many speakers, positive comments more often appeared in written form.

5.3.2 Emerging Themes

Financing/Funding: initial implementation financing; operating and maintenance costs; local taxes.

Many questions and comments were posed regarding the financial framework needed to implement a regional rail system. Would the financing be federal, state, or local? What does "local share" mean? Would federal transportation grants be applicable to this project? Would the citizens in a locality be able to vote on this issue at the ballot? Cost/benefits issues were raised, especially in comparison to other transportation modes, i.e.: highway expansion, bus service.

Funding for operations was also a concern. Would operations be covered by the farebox? Would the system require subsidies and if so for how long? Would taxes be required to support continued operation? It was not unusual for speakers to share their apparent familiarity with details of systems in other cities/regions.

Operations: possible system ownership/management, fares, running times, station locations, distribution and connections.

Details regarding operations were often the subject of questions and remarks. Some speakers' comments implied a belief that a rail system was, and should be, 'in the pipeline.' Some others questioned whether the ridership projections could justify implementation. Fare structures, who would operate the system, the tiering of phases, station locations, especially the terminus location in downtown Cleveland, and connections and distribution links at stations were repeated concerns.

Impacts: on safety, emergency access, natural resources, property values; concern that upgraded tracks would necessarily mean additional freight traffic.

The impacts of commuter rail, both positive and negative, were brought forth at each meeting. Proponents said they favored the possibility of future development concentrated along each corridor, and said they believed property values would increase with convenient access to transit. They said reduction in highway commuter traffic and a reduction in air and noise pollution were incentives for backing a commuter rail system. Requests for no-build scenarios were submitted.

Negative impact questions and remarks were more recurrent, especially in Corridors 4 and 6, with numerous concerns and objections from persons who said they live next to or near the tracks. These speakers envisioned safety problems from busier at-grade crossings, with more frequent train traffic on tracks that are now inactive or low-use. Opponents cited dangers to children, interruption of access for emergency vehicles, negative environmental impacts, noise pollution, and an adverse effect on property values.

Political and Decision-Making Process: who decides, what might role of citizens be, opportunities for local ballots or other direct involvement in final decisions.

Questions and comments regarding the political and planning processes that surround this project were advanced. The sentiment that citizens might be left out of the decision making process was apparent, both from advocates who wanted to affect specific implementation decisions to opponents wanting to know how they could “pull the plug on this thing”.

5.4 TIERING DECISIONS

On March 21, 2001, the CRAC considered the results of the nine public meetings and voted to make one modification to its tiering recommendation. In the Early Term program, the CRAC voted to reduce the assumed level of service between Aurora and Mantua from LOS-3 (11 to 12 daily round trips, 30 to 35 minute headways in the peak) to LOS-1 (3 daily round trips, 45 minute peak headway).

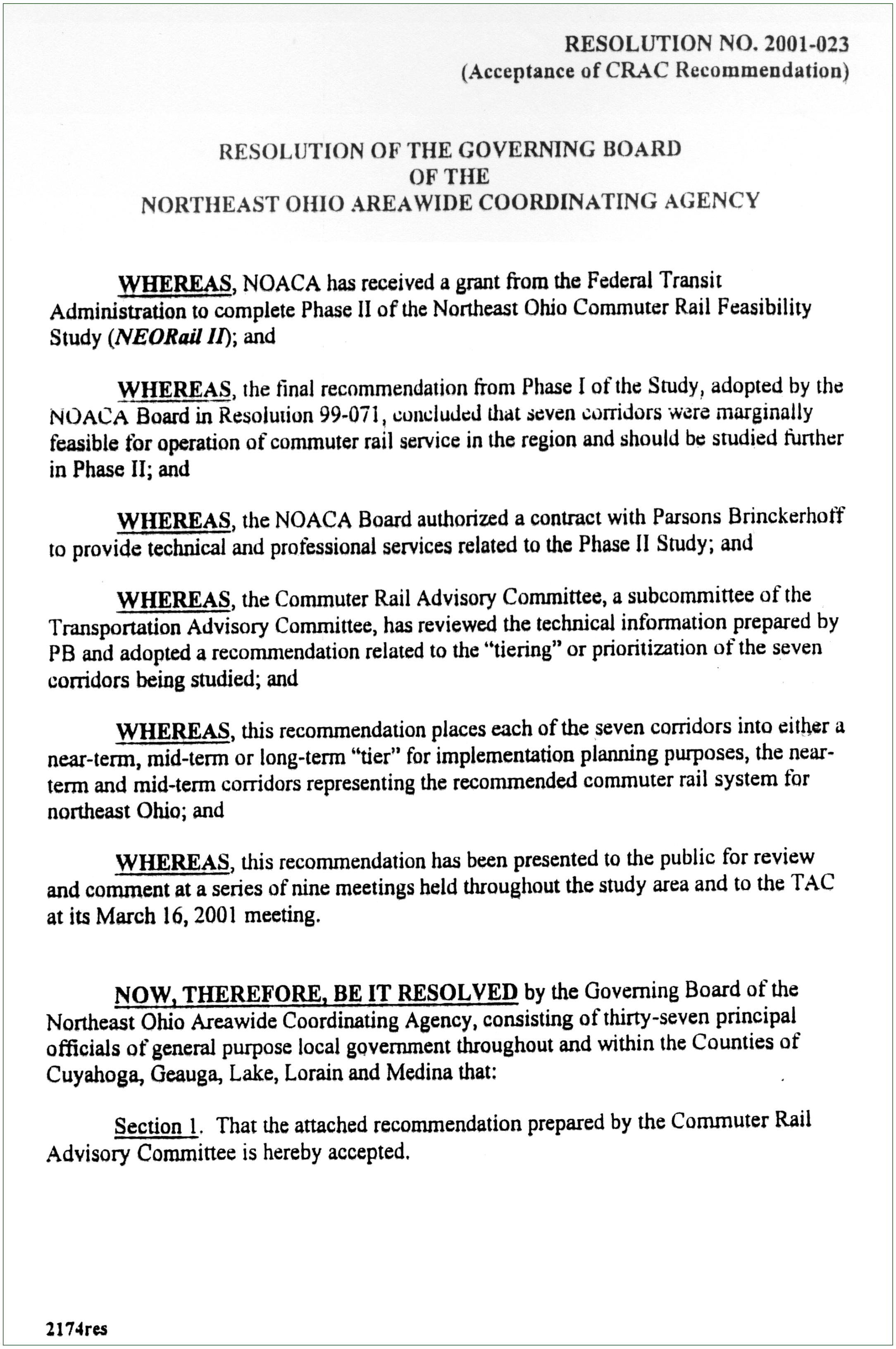
NOACA’s Transportation Advisory Committee and the NOACA Board considered the CRAC’s tiering recommendations during March and April. On April 11, 2001 the Board adopted Resolution 2001-023 endorsing the CRAC recommendations (See attached resolution). The AMATS and SCATS Boards were presented with the Tiering Recommendations prepared by the CRAC, but they did not take formal action at this time.

5.5 Route 1 (Cleveland to Lorain) Corridor Issues

As part of the Surface Transportation Board (STB) approval of the Conrail acquisition, freight rail traffic on the corridor identified in this study as Route 1 (Cleveland to Lorain) was restricted to an average of 13.9 trains per day. Projected to grow significantly in pre-merger planning documents, this limitation was a major victory for the westshore communities of Bay Village, Lakewood and Rocky River, as well as for Congressman Dennis Kucinich who played an active role in the process. This restriction was formalized in a written agreement between the track owners, Norfolk Southern, and these same westshore communities.

Citing this agreement, representatives of the westshore communities, along with Cong. Kucinich met with NOACA staff to discuss commuter rail in this corridor. The meeting resulted in unanimous opposition to operating commuter rail in this corridor. In addition to the STB agreement, representatives cited safety, noise and pollution concerns as the primary basis for the opposition. This opposition represents not only the communities along a significant portion of the proposed commuter rail route, but the local congressional representative whose support would be critical in obtaining essential federal funding for the project.

As a direct result of this meeting and the opposition expressed, implementation of commuter rail in this corridor is unlikely unless conditions change significantly. Based on this information, expending any additional planning and/or implementation resources in this corridor may not bet warranted and it is recommended that commuter rail not be pursued in the Route 1 Corridor at this time.



RESOLUTION NO. 2001-023
(Acceptance of CRAC Recommendation)

RESOLUTION OF THE GOVERNING BOARD OF THE NORTHEAST OHIO AREAWIDE COORDINATING AGENCY

WHEREAS, NOACA has received a grant from the Federal Transit Administration to complete Phase II of the Northeast Ohio Commuter Rail Feasibility Study (***NEORail II***); and

WHEREAS, the final recommendation from Phase I of the Study, adopted by the NOACA Board in Resolution 99-071, concluded that seven corridors were marginally feasible for operation of commuter rail service in the region and should be studied further in Phase II; and

WHEREAS, the NOACA Board authorized a contract with Parsons Brinckerhoff to provide technical and professional services related to the Phase II Study; and

WHEREAS, the Commuter Rail Advisory Committee, a subcommittee of the Transportation Advisory Committee, has reviewed the technical information prepared by PB and adopted a recommendation related to the "tiering" or prioritization of the seven corridors being studied; and

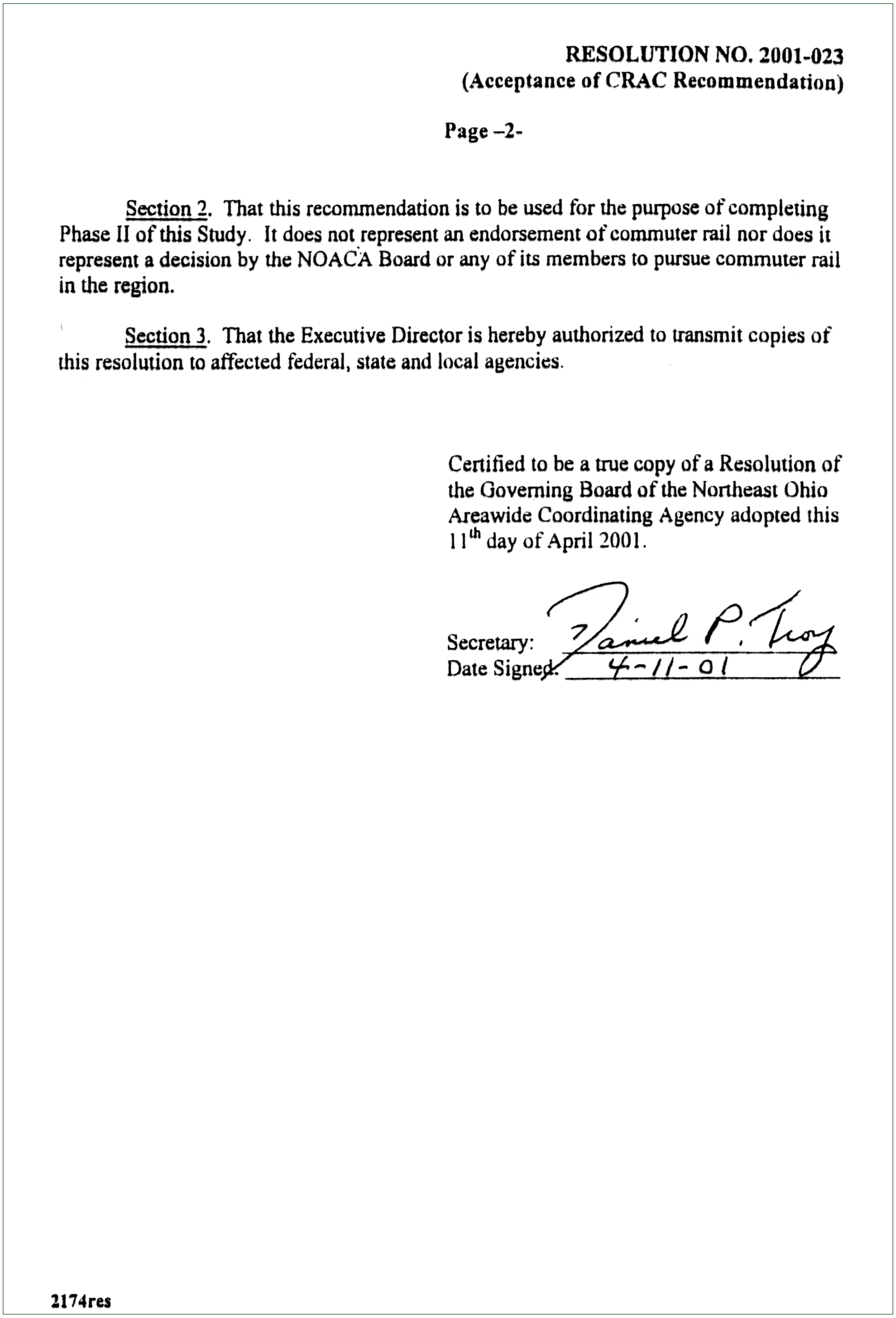
WHEREAS, this recommendation places each of the seven corridors into either a near-term, mid-term or long-term "tier" for implementation planning purposes, the near-term and mid-term corridors representing the recommended commuter rail system for northeast Ohio; and

WHEREAS, this recommendation has been presented to the public for review and comment at a series of nine meetings held throughout the study area and to the TAC at its March 16, 2001 meeting.

NOW, THEREFORE, BE IT RESOLVED by the Governing Board of the Northeast Ohio Areawide Coordinating Agency, consisting of thirty-seven principal officials of general purpose local government throughout and within the Counties of Cuyahoga, Geauga, Lake, Lorain and Medina that:

Section 1. That the attached recommendation prepared by the Commuter Rail Advisory Committee is hereby accepted.

2174res



RESOLUTION NO. 2001-023
(Acceptance of CRAC Recommendation)

Page –2-

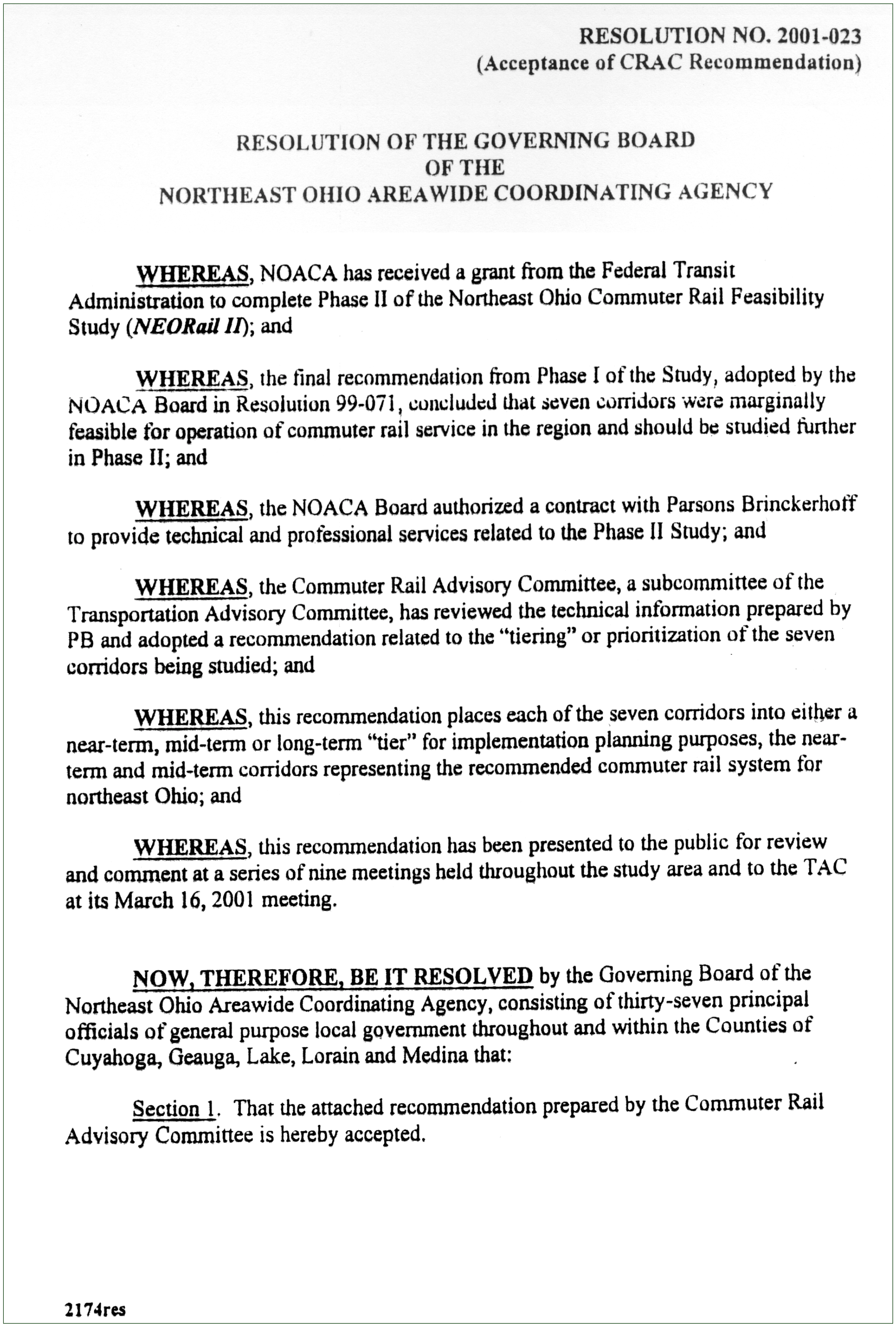
Section 2. That this recommendation is to be used for the purpose of completing Phase II of this Study. It does not represent an endorsement of commuter rail nor does it represent a decision by the NOACA Board or any of its members to pursue commuter rail in the region.

Section 3. That the Executive Director is hereby authorized to transmit copies of this resolution to affected federal, state and local agencies.

Certified to be a true copy of a Resolution of the Governing Board of the Northeast Ohio Areawide Coordinating Agency adopted this 11th day of April 2001.

Secretary: Daniel P. Troy
Date Signed: 4-11-01

2174res



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Section 1. That the attached recommendation prepared by the Commuter Rail Advisory Committee is hereby accepted.

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Commuter Rail Advisory Committee Final Recommendations

Adopted May 30, 2001

As a result of the Northeast Ohio Commuter Rail Feasibility Study (*NEORail*), Phase II, the Commuter Rail Advisory Committee recommends that the Board of the Northeast Ohio Areawide Coordinating Agency (NOACA), the Policy Committee of the Akron Metropolitan Area Transportation Study (AMATS), and the Policy Committee of the Stark County Area Transportation Study (SCATS) take the following actions:

1. Accept the findings of the *NEORail* Phase II Study, and forward the results to the counties, townships, cities, and regional transit authorities in the nine-county study area.
2. Advance the concept of commuter rail for Northeast Ohio by endorsing further exploration of the commuter rail system recommended in the *NEORail* Phase II Final Report (see attached map) by:
   - ➢ Facilitating efforts of interested and affected public officials from the nine-county study area to continue the public dialogue on implementation of commuter rail in northeast Ohio.
   - ➢ Assisting in formation of regionally based or corridor based committees organized to oversee the following steps:
     - Review the findings in the *NEORail* Phase II Final Report and assess current conditions;
     - Evaluate and recommend funding and governance plan;
     - Obtain necessary local and regional support for commuter rail funding and operations;
     - Coordinate commuter rail planning and development with state, regional and local transportation agencies;
     - Guide continued discussion and coordination with the affected railroads as well as monitor other passenger rail initiatives for possible cost sharing and service opportunities;
     - Provide on-going policy direction until such time as a more permanent governing body is established; and
     - Secure funding for further planning including possible Alternatives Analysis studies.
3. Participate in Alternatives Analysis Study(s) of the commuter rail corridors recommended in the *NEORail* Phase II Final Report as initiated by the regional/corridor committees.
4. Create a Regional Rail Committee including membership from the *NEORail* study area, with the following responsibilities:
   - ➢ Provide regular reports to the Transportation Advisory Committees and Policy Boards/Committees of NOACA, AMATS and SCATS on passenger and freight rail issues impacting northeast Ohio
   - ➢ Monitor the status of regionally significant rail rights-of-way and provide recommendations on efforts to preserve these facilities for regional transportation options
   - ➢ Assist MPO staff in development of passenger and freight railroad policies and programs

Chapter 6: Implementation Strategy

6.1 Governance
6.2 Finance Plan
6.3 Liability and Insurance
6.4 Rolling Stock Strategy

CHAPTER 6 - IMPLEMENTATION STRATEGY

6.1 GOVERNANCE

“Governance” refers to the governmental entity or entities that will organize and manage the service, set policy (fares, schedules), collect and disburse revenues, and assume financial risks. This governmental entity will not necessarily own the commuter rail assets or operate the service – it is expected that most of the track and right-of-way would continue to be the property of the railroads, while the service could be operated under contract by a third-party operator. But, the governing entity will be responsible for establishing the service and managing operations day-to-day.

6.1.1 Institutional Arrangements for Commuter Rail

This section offers examples of institutional arrangement for commuter rail found elsewhere in the United States and evaluates the governance options that are available in the Northeast Ohio region under the Ohio Revised Code.

A variety of institutional arrangements have been used to establish and operate commuter rail in other US cities. In some metropolitan areas, commuter rail is managed by the state departments of transportation. In others, new agencies have been created for the specific purpose of providing commuter rail service. Some regional transit authorities offer commuter rail as part of a more diverse system of public transportation services. Elsewhere, commuter rail service is provided by a joint powers board or authority. Commuter rail service may also be provided through an interagency agreement between two or more existing governmental agencies.

Joint Powers Boards or Authorities are new entities created under State law to allow two or more government agencies to “jointly” exercise their powers with respect to a specific purpose or set of objectives. The entity may have its own staff, or may depend upon the staff of one of its member agencies. This mechanism has been used to set up commuter rail governing entities in California and Florida.

An interagency agreement among existing agencies is another mechanism that is used to set up a governance structure for commuter rail. Such agreements may or may not create a new intergovernmental entity. An Ohio example is the agreement between the Southwest Ohio Regional Transit Authority (SORTA) and the Transit Authority of Northern Kentucky (TANK), which serve the Cincinnati region, to jointly manage regional transit facilities. It is discussed in more detail in Section 6.1.2 of this report.

Table 6.1 offers examples of each type of governance arrangement.

Table 6.1
Examples of Commuter Rail Governing Entities

Type of Agency	Examples
State DOT	o MARC (Maryland) o New Jersey Transit o Connecticut DOT
Commuter Rail Operating Agency	o METRA (Chicago) o Metro North Railroad and Long Island Rail Road (New York City)
Regional Transit Authority	o SEPTA (Philadelphia) o MBTA (Boston)
Joint Powers Board or Authority	o CalTrain (San Francisco Bay Area) o Altamont Commuter Express (San Francisco Bay Area) o Metrolink (Southern California) o Tri-County Commuter Rail (South Florida)
Interagency Agreement	o Virginia Railway Express (Northern Virginia) o Trinity Railway Express (Dallas-Fort Worth)

6.1.2 Provisions of Ohio Revised Code

The Ohio Revised Code provides the current legislative basis for establishing and operating commuter rail in Northeast Ohio.

Ohio Rail Development Commission. Chapter 4981 of the Revised Code establishes the Ohio Rail Development Corporation (ORDC), an independent agency of the state within the Ohio Department of Transportation. ORDC is the successor of the Ohio High Speed Rail Authority and ODOT's Division of Rail Transportation, and is charged with:

- Developing, promoting, and supporting safe, adequate and efficient rail service throughout the state;
- Maintaining adequate programs of investigation, research, planning, and development for rail service; and
- Providing for the participation of private corporations or organizations.

Section 4981.04 requires ORDC to plan for, construct, and operate intercity conventional or high-speed passenger transportation, with the initial route connecting Cleveland, Columbus and Cincinnati. It is also authorized, in Section 4981.14, to "undertake or cause to be undertaken the acquisition, renovation, repair, refunding, operation, maintenance, or construction of *any rail service project*" (emphasis added). Under Section 4981.02, however, public funds acquired by the commission may not be used for operating rail service unless the general assembly specifically approves the expenditure of funds for this purpose.

County and Regional Transit Authorities. Chapter 306 of the Ohio Revised Code sets forth the authorities that Ohio's counties have with regard to public transportation. Section 306.01 authorizes counties to create a county transit system and appoint a county transit board. Also, under Section 306.31, a county or multiple counties, municipal corporations, or townships may create a regional transit authority (RTA) to acquire, construct, operate, maintain, replace, improve and extend transit facilities. An RTA is a political subdivision of the state and a body corporate with all the powers of a corporation.

Under these provisions of the Code, five transit systems have been created to serve parts of the NEORail study area. They are:
- Greater Cleveland Regional Transit Authority (GCRTA) in Cuyahoga County
- Laketran RTA in Lake County
- METRO RTA in Summit County
- Stark Area Regional Transit Authority (SARTA) in Stark County
- Portage Area Regional Transit Authority (PARTA) in Portage County

County transit systems have been established in:
- Medina County
- Lorain County
- Geauga County

Two provisions of Chapter 306 of the Revised Code deserve special mention because they may affect the institutional arrangements that are possible for commuter rail under current state law:

- Section 306.32 prohibits the creation of a new regional transit authority that include any area already included in a regional transit authority. If a new regional transit authority is created, the existing transit authorities serving the same geographic area would need to be dissolved.
- Section 306.44 authorizes regional transit authorities to enter into contracts or other arrangements with the State, counties, municipalities, or other governmental entities, and with public and private corporations to exercise their powers.

Under the authority of Section 306.44, the Southwest Ohio Regional Transit Authority (SORTA) has entered into an Interlocal Cooperative Agreement with the Transit Authority of Northern Kentucky (TANK) for the joint sharing, funding, construction and operation of transit facilities and services, possibly including light rail. A six-member joint committee – the Interlocal Policy Committee – was established by the SORTA and TANK Boards. This committee makes recommendations for approval by the two Boards. SORTA and TANK also established an Interlocal Management Committee, consisting of the General Manager of each transit authority. One responsibility of the Interlocal Management Committee is to establish a mechanism for management of Preliminary Engineering for light rail, including the hiring of a management entity.

6.1.3 Evaluation of Governance Options

The NEORail II Study identified four governance options for developing and managing commuter rail service in Northeast Ohio – the State of Ohio (ODOT or ORDC), a new regional commuter rail authority, an existing RTA, and an interlocal agreement among counties or RTAs pursuant to Section 306.44. Table 6.2 lists the advantages and disadvantages of each arrangement.

Table 6.2
Governance Options for Northeast Ohio

	Advantages	Disadvantages
State of Ohio (ODOT or ORDC)	o No need to create a new organization o Coordination with state rail system planning	o Potentially removes commuter rail policy decisions from local level
New Regional Commuter Rail Authority	o Regional focus and perspective o Long term commitment	o Requires change in state authorizing legislation or dissolution of existing RTAs within the service area o New layer of government, possibly with taxing authority o Coordination with RTAs
Existing Regional Transit Authority	o No need to create new organization	o Potential lack of regional perspective o Lack of mechanism for regional policy-making o Uncertain long-term commitment
Inter-Local Agreement among counties or RTAs	o Regional focus and perspective without new level of government o Flexibility o Coordination with the counties and existing RTAs	

While the use of an interlocal agreement as was done in the Cincinnati area does have some appeal for the northeast Ohio region, there is no compelling technical reason to recommend one governance option over another. All have potential applicability. The NEORail Commuter Rail Advisory Committee (CRAC) has elected not to make a recommendation on a specific governance option at this time.

6.2 FINANCE PLAN

The feasibility of commuter rail in large part hinges on the availability of funds to pay for building and operating the system. This section assesses the availability of existing funding, identifies potential shortfalls, and presents funding options. It concludes with a working draft implementation schedule and funding plan.

Estimated Cost

The capital and operating costs of commuter rail are presented in Chapter 4 of this report. Table 6.2.1 provides a summary of the costs for the Early-Term and Mid-Term programs.

Table 6.2.1
Capital Cost, Operations and Maintenance (O&M) Cost, and Subsidy

	Capital Cost (2000 dollars, millions)	O&M Cost (2000 dollars, millions per year)	O&M Subsidy (2000 dollars, millions per year
Early-Term	$296	$10.5	$7.1
Mid-Term	$547	$21.1	$16.5
Early-Term plus Mid-Term	$843	$31.6	$23.6

6.2.1 Available Revenues

In Northeast Ohio, a primary source of both capital and operating revenue for transit is a locally enacted sales and use tax. The Ohio Revised Code authorizes both counties and regional transit authorities to levy local sales and use tax in addition to the state sales tax for the purposes of raising revenue for transit capital and operating expenses. Transit authorities are authorized in Section 5739.023 of the Ohio Revised Code to levy a “piggyback” sales tax on retail sales made within the territory of the transit authority of not more than 1½ percent, subject to voter approval. The tax may be in effect for a specific number of years or for a continuing period of time, as specified by the transit authority. The sales tax can be increased in ¼ percent increments to the maximum levels, subject to voter approval.

Four transit authorities in the project area – GCTRA, Laketran, METRO and SARTA – have levied the additional sales tax for transit use. Approved tax rates and 1999 collections for each transit authority are shown in Table 6.2.2. [1]

Table 6.2.2
Transit Authority Permissive Sales Tax Collections

Transit Authority	County	Tax Rate	1999 Collections
GCRTA	Cuyahoga	1.00%	$151,405,646
Laketran	Lake	0.25%	$6,731,568
METRO	Summit	0.25%	$15,283,091
SARTA	Stark	0.25%	$9,876,829
PARTA	Portage	0.00%	$0
Total			$183,297,134

Source: 2000 Annual Report, Ohio Department of Taxation, November 18, 2000

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[1] PARTA passed a tax levy on the November 6, 2001 ballot of .25 % for 5 years (estimated to raise $2 million per year)

Sales tax revenues are used to fund each system's capital, operating and maintenance requirements. To assess the availability of funds for commuter rail, transit agency financial plans prepared for other projects were reviewed, along with the financial projections of the three metropolitan planning organizations (MPOs) serving the NEORail study area.

The GCRTA has conducted several financial planning analyses. The Fiscal Capacity Projection for the Euclid Corridor Transportation Project (ECTP)[2] included cash flow projections for 2000-2019 assuming the Euclid project and continued operation and maintenance of the existing GCRTA system. A preliminary financial analysis for GCRTA's proposed Blue Line Extension[3] addressed the core system plus the proposed ECTP and Blue Line Extension projects. When the ECTP and Blue Line Extension capital improvements are included in the cash flow analysis, deficits are indicated in both operating and capital funds. Other planned GCRTA capital investments, such as the Waterfront Line Extension, were not included in these analyses. Thus, development and operation of commuter rail could not be supported by revenues generated by the existing 1.00% piggyback sales tax in Cuyahoga County, while at the same time supporting existing and planned GCRTA services.

The availability of existing revenues to fund a commuter rail program was also assessed by reviewing the transportation plans that have been adopted by each of the three MPOs in Northeast Ohio. Under Federal law, an MPO's transportation plan must be financially constrained, meaning that the plan cannot include projects for which funding is not reasonably foreseeable. Only those projects included in the financially constrained plan may be advanced for Federal funding. (Projects for which funding is not reasonably foreseeable can be included in the plan as an "illustrative project", in order to identify projects might be advanced if additional revenues were to become available. However, "illustrative projects" are not eligible for Federal participation.)

Each of the three MPOs in the NEORail study area – the Northeast Ohio Areawide Coordinating Agency, the Akron Metropolitan Area Transportation Study, and the Stark County Area Transportation Study – have included NEORail in their plans as illustrative projects only. Sufficient funding to build, operate, and maintain the commuter rail system is not considered to be reasonably available from existing sources.

In each of the three MPO plans, funds were identified that have not yet been assigned to projects. The NOACA plan, for example, does not identify uses for all of the "enhancements" and "efficiency" funding that the region can expect to receive. Similarly, the AMATS and SCATS plans do not identify projects for all of the Federal funds that the region is expected to receive. Thus, while not all funds available under the financially-constrained MPO long range plans are currently committed to projects, the uncommitted funds would not be sufficient to build and operate the commuter rail system as recommended by this study.

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[2] Euclid Corridor Transportation Project, New Starts Application Update, Greater Cleveland Regional Transit Authority, September 15 2000.

[3] Draft Financial Analysis Report, Blue Line Extension MIS, Parsons Brinckerhoff Ohio, Inc., February 2001.

6.2.2 Potential Sources of New Revenue

A variety of Federal, State, and local revenues sources are potentially available to generate new revenues for commuter rail. These sources are briefly described below in the form of a “menu” of potential funding sources. A detailed discussion of potential funding sources is provided in Appendix I.

Federal Grants. The following federal grant programs are potential capital funding sources. Many of these are allocated by formula and have already been taken into account in the financial analyses of available revenues discussed above. Only the Section 5309 New Starts program offers a significant potential source of new funding to Northeast Ohio.

- *Section 5309 New Starts Program*. The Federal Transit Administration’s (FTA) discretionary program that funds new fixed guideway systems (heavy rail, light rail, commuter rail, busways, etc.) and extensions in metropolitan areas. The program provides more than $1 billion per year. Funding decisions are made through the congressional appropriations process.
- *Section 5307 Program:* FTA’s Urbanized Area Formula Program through which funds for capital replacement and expansion are distributed to transit operators and states.
- *Job Access and Reverse Commute Grants:* Competitive grants for transportation services that connect welfare recipients and low-income persons to employment and support services. In FY 1999, $75 million was available nationwide. Not more than $10 million per year may be used for reverse commute activities.
- *Congestion Mitigation and Air Quality (CMAQ) Program:* Formula program administered by the Federal Highway Administration (FHWA), whose primary purpose is to fund projects that reduce emissions in air quality non-attainment and maintenance areas. Projects can include highway, transit, ITS or other improvements. The Cleveland-Lorain area is a non-attainment area.
- *Surface Transportation Program (STP):* Formula program through which funds are allocated to states and metropolitan areas for highways, transit capital, and bus terminals and facilities.
- *National Highway System (NHS*): FHWA formula program that provides funding for improvements to rural and urban roads that are part of the National Highway System (NHS). Under certain circumstances, funds can be used for transit.
- *Interstate Maintenance:* FHWA formula program for resurfacing, restoring, rehabilitating, and reconstructing most routes on the Interstate System. Up to 50% of a State’s apportionment may be transferred to NHS, STP, CMAQ, and/or Bridge.
- *Section 130 Grade Crossing Program:* Formula program provides funds for highway/railroad grade crossing safety improvements.

State Programs. The following State of Ohio programs might provide capital or operating funds for major transit capital improvement projects.

- *TRAC Funds:* A decision-making body of the Ohio Department of Transportation that administers federal transportation funds from such sources as the National Highway System (NHS) and Surface Transportation Program (STP) funds, as well as some state transportation funds. Funds are made available for Tier I major improvement projects that have been approved for construction. This program has generally not supported transit improvements.

- *Ohio Public Transportation Grant Program*: The program has three components: a formula component for operating, planning or capital costs; a discretionary capital component; and a supplemental capital component.
- *Ohio Rail Development Commission (ORDC)*: Grant and loan program funds can be used to rehabilitate existing rail lines and develop new ones. Using federal funds and Ohio Public Utilities Commission funds it administers through its rail safety programs, ORDC also provides funds for projects to increase safety at rail grade crossings through the installation of warning lights and other safety devices.
- *State Motor Vehicle License and Gasoline Taxes:* The current administrative interpretation of the Ohio Constitution[4] limits the types of improvements and costs for which the state gasoline tax can be used and excludes transit expenditures[5]. In addition to the re-interpretation of the tax use, modest increases in the motor vehicle license or gasoline taxes could provide additional revenues for transit without reducing potential revenues to existing beneficiaries.

New Local Funding. As discussed previously, Ohio counties and transit authorities have authority to levy several forms of taxes to meet the capital and operating costs of transit. While existing rates of taxation do not provide sufficient revenues for commuter rail, substantial revenues may be obtained by increasing the rate of taxation.

- *Regional Transit Authority Sales Tax:* Regional transit authorities may, subject to voter approval, levy additional “piggyback” sales taxes within their jurisdictions to raise additional capital and operating revenues. For illustrative purposes, Table 6.2.3 summarizes the potential annual revenues, in year 2000 dollars, that could be generated if each RTA were to increase the piggyback transit tax to the legal limit of 1½%.

Table 6.2.3
Projected Transit Authority Sales Tax Collections

Transit Authority	County	Proposed Tax Rate	Projected Collections [1]	Additional Sales Tax Revenue [2]
GCRTA	Cuyahoga	1.50%	$236,192,808	$78,730,936
Laketran	Lake	1.50%	$42,004,984	$35,004,154
METRO	Summit	1.50%	$95,366,488	$79,472,073
SARTA	Stark	1.50%	$61,631,413	$51,359,511
PARTA [3]	Portage	1.50%	$22,777,797	$22,777,797
Total				$267,344,471

Notes:
1 Cost in 2000 dollars; assumes a 4% growth rate in 1999 sales tax collection levels
2 Projected collections minus collections derived from existing tax authority.
3 Based upon 1999 sales tax collections for Portage County

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[4] Ohio Constitution, Article XII, §5a.

[5] Greater Cleveland Regional Transit Authority, *Long Range Plan*, January 1998.

- *County Sales Tax*: The Ohio Revised Code also authorizes counties to levy local sales and use tax for the purposes of raising additional general revenue and for transit capital and operating expenses. Counties are authorized in § 5739.021 of the Ohio Revised Code to levy a "piggyback" sales tax of up to 1% to provide additional county general revenue. The tax is levied pursuant to a resolution of the county commissioners and is subject to repeal by majority vote of the county electorate. Section 5739.026 of the Ohio Revised Code further authorizes counties to levy an additional ½ percent sales tax, subject to voter approval, for one or more of the following purposes:
    - Payment of bonds issued for a convention facility
    - Revenue for a transit authority
    - Additional county general revenue
    - Revenue for permanent improvements
    - Implementation and operation of a 911 system
    - Operation and maintenance of a detention facility

    The "piggyback" tax can be increased in ¼% increments to the maximum levels, subject to voter approval.

While it is legally feasible for both an RTA and a county to levy "piggyback" sales taxes to raise additional revenue for transit, in the northeast Ohio region the regional transit authority permissive sales tax has been utilized as a means of raising additional revenues, rather than the county sales tax.

- *Property Tax Revenue:* Regional transit authorities may exercise the property taxing authority granted by state law (§ 306.49) to impose a levy of up to five mills[6] annually on real property within its operating boundary for a period of up to ten years, subject to voter approval. The revenues derived from this property tax may be used for any purpose except bond debt charges. No transit authorities in the northeast Ohio study area have currently made use of this taxing authority.

- *General Obligation Bonds:* Ohio law permits regional transit authorities to issue both unvoted and voted general obligation bonds, secured by the "full faith and credit" of the RTA. Unvoted bonds are also backed by the power of the RTA to levy and collect ad valorem property taxes and other taxes. There are, however, three limitations on a regional transit authority's ability to issue debt:
    1. Ohio law (§ 306.40) limits the principal amount of bonds which are supported by property taxes to five percent of the assessed valuation with the RTA's territory.
    2. Ohio law (§ 306.40) also restricts annual principal and interest payments on the RTA's unvoted general obligation bonds to one-tenth of one percent (0.1%) of the assessed valuation.
    3. The Ohio Constitution (Article XII, Section 11) requires that the RTA provide for the levying of taxes, including property taxes, sufficient to pay the principal and interest on that debt. The state constitution (Article XII, Section 2) and Ohio Revised Code (§ 5705.02) impose a 10 mill limit on the amount of taxes that may be levied by all political subdivisions within

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[6] A mill is $1.00 for each $1,000.00 of taxable value.

the same taxing district without voter approval. In other words, the ability of an RTA to issue unvoted general obligation debt is shared with overlapping political subdivisions such as the cities, counties and local school districts. Within the NEORail study area, the GCRTA has levied a 0.35 mill property tax to support its debt on unvoted bond issues.

- *Revenue Bonds:* In addition to their ability to issue general obligation bonds, as discussed in the previous section, regional transit authorities have also been granted the authority to issue revenue bonds[7] secured by a pledge of and a lien on the revenues of the authority derived from rentals, fees, rates, charges, the authority's allocation of additional sales tax levied under § 5739.026 of the Ohio Revised Code or other revenues, after operating and maintenance costs have been satisfied. The revenue bonds may also be secured by a mortgage on any real property or interests acquired with the proceeds from the bonds.

Ohio law (§ 306.44) gives RTA's the authority to enter into contracts and other agreements, including agreements with other government entities for the benefit of a common undertaking, as was done by the Cincinnati-area RTA. If a governance body was formed through an agreement between two or more RTA's or other political subdivisions, the RTA's could utilize their ability to issue revenue bonds as a means of financing transit construction or improvements.

- *Transportation Improvement Districts:* Legislation[8] has been established in Ohio allowing the creation of transportation improvement districts (TID), a type of benefit assessment district. This legislation allows governments and transit authorities to acquire new taxing power to gain revenues from areas that benefit from specific projects. The TID has the authority to[9]:
  - Issue revenue bonds to provide funds to pay for the costs of any project.
  - Receive and accept loans and grants for the construction, maintenance, or repair of any project from the federal, state or local government.
  - Establish and collect tolls or user charges for its projects.
  - Levy special assessments to provide for the construction, reconstruction, improvement, alteration, or repair of any road, highway, public place, building, or other infrastructure, if the TID board of trustees determines that the public improvement will benefit the area where it will be located, subject to public hearing of affected property owners. The special assessments will be levied against properties in the area to be benefited by the proposed improvement. The board of trustees shall determine the portion of the costs of the proposed improvement to be assessed and the period necessary to repay the bond or other obligation issued for the improvement. However, the amount shall not exceed ten per cent of the assessable value of the lot or parcel being assessed. Assessments may be paid in full in a lump sum or may be paid and collected in equal semiannual installments, equal in number to twice the number of years for which the lease of the improvement is made or twice the number of years that the bond or other instrument that the assessments are pledged to pay requires.

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[7] Ohio Revised Code, §306.37.

[8] Ohio Revised Code, §5540.02.

[9] Ohio Revised Code, §5540.03 and §5540.031.

Ohio statute[10] limits the provision of department of transportation-appropriated funds to no more than five transportation districts created under § 5540.02.

- *Joint Development:* Developers of new office or industrial developments within the proposed rail corridors, in partnership with the regional transit agency(s) or other public entity, are another potential revenue source. Until 1997, federal (UMTA/FTA) policy with regard to such joint development was restrictive. To prevent transit systems from “double dipping” on their federal subsidies, federal transit dollars could be used to defray only the “net” costs of a joint development project at prevailing matching rates. The term “net” referred to costs remaining after any economic or other return from the project’s private partner. In effect, transit systems were expected to pay back any federal grant funds that resulted in private income to the agency through joint development. This obviously created great reluctance on the part of transit operators to engage in joint development, as it created a direct substitution effect between federal dollars and private income.

- *Other:* Local jurisdictions may offer to build, operate and maintain the stations with their own revenues. Advertising and concession revenues may offset some operating costs.

Of these potential sources of new local revenue, both the sales tax and the property tax are broad based, offer significant revenue generation potential, and are stable and reliable. Other potential local funding sources are likely to generate significantly less revenue than either the sales tax or the property tax. Such sources might well complement – but probably are not a substitute for – a broad based revenue source such as the sales tax. Table 6.2.4 identifies some of the advantages and disadvantages of the sales and property taxes as potential funding sources for NEORail.

Table 6.2.4
Advantages and Disadvantages of Sales and Property Taxes to Fund NEORail

	Advantages	Disadvantages
Sales Tax	o Traditional source of transit funding in Northeast Ohio o Tends to be more acceptable to the public than the property tax o Commuter rail and other improvements could be combined in a referendum to increase tax by ¼ percent.	o Perceived to be a regressive tax o Many other improvements are already being funded with the sales tax. The public may be reluctant to support a further increase.
Property Tax	o Tax deductible for those who itemize	o Could entangle NEORail in debate over property tax and education funding

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[10] Ohio Revised Code, §5540.151.

6.2.3 Working Draft Financial Plan

To illustrate the annual funding requirements that would be associated with implementing the Early-Term and Mid-Term phases of NEORail, a Working Draft Financial Plan has been developed. The draft assumes that the capital cost of the program will be shared among the Federal government, state government, and local governments as follows:

Federal share:	50%
State share:	25%
Local share:	25%

The draft further assumes that all operating subsidies will be the responsibility of local governments.

At this feasibility study stage, the assumed allocation of funding shares is no more than a working assumption. Nevertheless the assumed shares are similar to the funding shares for many other more advanced major transit projects across the country. The FTA's Section 5309 New Starts program is highly competitive, and one strategy that project sponsors have used to make their projects more attractive is to request a smaller Section 5309 share. The average Section 5309 share for New Start projects across the country is now very close to 50%.

The Working Draft Financial Plan further assumes a schedule for further planning and project development. The schedule assumes that the Early-Term program would proceed immediately and would go through the normal steps in the planning and project development process – alternatives analysis (a.k.a. Major Investment Study), preliminary engineering, final design, construction, and operation. Each of these phases is assumed to require about two years, with the exception of Mid-Term program construction, which is assumed to require three years. The schedule further assumes that the Mid-Term program would parallel the Early-Term program with a two-year differential.

Under this scenario, the Early-Term program would begin operating in 2010 and the Mid-Term program would begin operating in 2013. The most significant requirements for capital funding would occur between 2008 and 2012, when the capital funding requirement would reach $150 million to $160 million per year in year 2000 dollars ($190 to $230 million per year in year of expenditure dollars). The requirement for operating funds would begin with the initiation of service in 2010 and would increase to $24 million per year (year 2000 dollars) in 2013 when service begins on the two Mid-Term programs.

Tables 6.2.5 and 6.2.6 present the Working Draft Financial Plan. Table 6.2.5 is in year 2000 dollars; Table 6.2.5 presents the same information in year of expenditure dollars.

Table 6.2.5
Working Draft Financial Plan
(Year 2000 Dollars)

Possible Implementation Schedule and Associated Annual Funding Requirements for NEORail Near and Mid Term Projects

(Costs and Revenues in Year 2000 Dollars)

MAJOR ASSUMPTIONS

Tier 1 proceeds immediately, Tier 2 lags 2 years behind (1 step behind in process)
Operating plan in opening year is same as 2025 operating plan for each tier
Farebox Recovery in all years corresponds to 2025 projection
Planning and PE costs are split 80% Federal and 20% local
Final Design and construction are 50% Federal, 25% State, and 25% local

OPERATING BUDGET

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
OPERATING REVENUES																	
Passenger Fares									$3	$3	$3	$8	$8	$8	$8	$8	$8
Local Operating Subsidy									$7	$7	$7	$24	$24	$24	$24	$24	$24
Total									$10	$10	$10	$32	$32	$32	$32	$32	$32
OPERATING EXPENSES																	
NEORail Tier 1 O&M Costs									$10	$10	$10	$10	$10	$10	$10	$10	$10
NEORAIL Tier 2 O&M Costs												$21	$21	$21	$21	$21	$21
Total									$10	$10	$10	$32	$32	$32	$32	$32	$32

CAPITAL BUDGET

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
CAPITAL REVENUES																	
Federal	$1.2	$1.2	$5.6	$5.6	$15	$15	$75	$76	$80	$80	$80						
State					$3	$3	$38	$38	$40	$40	$40						
Local	$0.3	$0.3	$1.4	$1.4	$5	$5	$38	$38	$40	$40	$40						
Total	$1.5	$1.5	$7.0	$7.0	$23	$23	$151	$151	$160	$160	$160	$0	$0	$0	$0	$0	$0
CAPITAL COSTS																	
Planning -- Tier 1	$1.5	$1.5															
Preliminary Engineering -- Tier 1			$6.0	$6.0													
Final Design -- Tier 1					$12	$12											
Construction -- Tier 1							$129	$129									
Planning -- Tier 2			$1.0	$1.0													
Preliminary Engineering -- Tier 2					$11	$11											
Final Design -- Tier 2							$22	$22									
Construction -- Tier 2									$160	$160	$160						
Total	$1.5	$1.5	$7.0	$7.0	$23	$23	$151	$151	$160	$160	$160	$0	$0	$0	$0	$0	$0

Table 6.2.6
Working Draft Financial Plan
(Year of Expenditure Dollars)

Possible Implementation Schedule and Associated Annual Funding Requirements for NEORail Near and Mid Term Projects
(Costs and Revenues in Year of Expenditure Dollars)

MAJOR ASSUMPTIONS
Tier 1 proceeds immediately, Tier 2 lags 2 years behind (1 step behind in process)
Operating plan in opening year is same as 2025 operating plan for each tier
Farebox Recovery in all years corresponds to 2025 projection
Planning and PE costs are split 80% Federal and 20% local
Final Design and construction are 50% Federal, 25% State, and 25% local
Costs escalated to Year of Expenditure assuming 3% per year escalation

OPERATING BUDGET

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
OPERATING REVENUES																	
Passenger Fares									$5	$5	$5	$12	$12	$13	$13	$13	$14
Local Operating Subsidy									$10	$10	$10	$35	$36	$37	$38	$39	$40
Total									$14	$15	$15	$46	$48	$49	$51	$52	$54
OPERATING EXPENSES																	
NEORail Tier 1 O&M Costs									$14	$15	$15	$15	$16	$16	$17	$17	$18
NEORAIL Tier 2 O&M Costs												$31	$32	$33	$34	$35	$36
Total									$14	$15	$15	$46	$48	$49	$51	$52	$54

CAPITAL BUDGET

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
CAPITAL REVENUES																	
Federal	$1.3	$1.3	$6.3	$6.5	$18	$18	$96	$99	$107	$111	$114						
State					$4	$4	$48	$49	$54	$55	$57						
Local	$0.3	$0.3	$1.6	$1.6	$6	$6	$48	$49	$54	$55	$57						
Total	$1.6	$1.6	$7.9	$8.1	$27	$28	$191	$197	$215	$221	$228	$0	$0	$0	$0	$0	$0
CAPITAL COSTS																	
Planning -- Tier 1	$1.6	$1.6															
Preliminary Engineering -- Tier 1			$6.8	$7.0													
Final Design -- Tier 1					$14	$15											
Construction -- Tier 1							$163	$168									
Planning -- Tier 2			$1.1	$1.2													
Preliminary Engineering -- Tier 2					$13	$14											
Final Design -- Tier 2							$28	$29									
Construction -- Tier 2									$215	$221	$228						
Total	$1.6	$1.6	$7.9	$8.1	$27	$28	$191	$197	$215	$221	$228	$0	$0	$0	$0	$0	$0
Escalation Factor	1.061	1.093	1.126	1.159	1.194	1.230	1.267	1.305	1.344	1.384	1.426	1.469	1.513	1.558	1.605	1.653	1.702

The sales tax and property tax increase necessary to fund the local share of project costs from these sources is shown in Table 6.2.7. The capital cost and operating subsidy requirements for the Near Term and Mid Term commuter rail programs could be met with a funding stream, in year 2000 dollars, of approximately $30 million per year. This revenue could be generated through a uniform 0.09% increase in the sales tax or a uniform 0.7 mill increase in the property tax across the seven-county study area.

Table 6.2.7
Sales and Property Tax Increase Necessary to Generate $30 million per year in Northeast Ohio
(Year 2000 Dollars)

	Sales Tax			Property Tax		
	Annual Sales (million 2000 dollars) (a)	Sales Tax Increase	Increased Revenues (million 2000 dollars)	Taxable Value (1999)(b)	Property Tax Increase (mills)	Increased Revenues (million 1999 dollars)
Ashtabula	$794	0.09%	$0.7	$1,102	0.7	$0.8
Cuyahoga	$16,191	0.09%	$14.6	$21,493	0.7	$15.0
Lake	$2,854	0.09%	$2.6	$3,920	0.7	$2.7
Lorain	$2,480	0.09%	$2.2	$3,558	0.7	$2.5
Portage	$1,217	0.09%	$1.1	$1,797	0.7	$1.3
Stark	$4,129	0.09%	$3.7	$4,395	0.7	$3.1
Summit	$6,646	0.09%	$6.0	$7,806	0.7	$5.5
Total			$30.9			$30.8

(a) SOURCE: Ohio Department of Taxation, Tax Data Series, Table S-3, No. 9, February 23, 2001
(b) SOURCE: Ohio Department of Taxation, 2000 Annual Report

Table 6.2.7 is offered for illustrative purposes, and is not intended to recommend any particular funding source or cost sharing formula. If the NEORail proposals go forward, the participating local governments and or transit authorities may wish to explore other funding opportunities and different ways to allocate the responsibility for capital and operating costs.

It should be noted that Ohio law currently requires the permissive sales tax be levied in ¼ percent increments. While that level of sales tax increase is more than what is necessary to fund the local share of Near Term and Mid Term NEORail project costs, tax revenues not utilized for NEORail costs could be used to meet other transit or county needs. For example, a 0.25% increase in the sales tax levied by the GCRTA could provide approximately $40.5 million in additional revenues. After covering the Cuyahoga County's $14.6 million share of NEORail costs, approximately $25.9 million would remain to fund other GCRTA improvements. Likewise, if a county tax is levied, the remaining funds could be used for education, safety, recreational or other county services.

6.3 LIABILITY AND INSURANCE

Freight rail companies are often very reluctant to allow commuter rail operations on their tracks, largely due to the potential of being held liable in the case of an accident. Sometimes extreme measures are required to accommodate the rail company's concerns – Federal legislation was required to indemnify Conrail before the Virginia Railway Express (VRE) was allowed to operate commuter rail service on the same mainline tracks. This section of the report reviews the issue of liability and insurance as it may pertain to commuter rail in Northeast Ohio.

6.3.1 Liability

Liability is a legal concept used to measure financial value of potential damage. Insurance or other means of indemnification can be used to limit and control but cannot totally eliminate liability.

In some instances, the freight rail company requires, as a condition of an agreement to allow passenger rail operations on their tracks, that the operator agree to indemnify the freight rail company against any liability for any accidents or damages related to the commuter rail service, regardless of the circumstances or the "Character of the Negligence." Indemnification is to be secured against legal responsibility for action and to be compensated for a loss. This means the public agency would indemnify the freight rail company even in instances where an accident occurred as a result of negligence by the freight rail company (train operator under the influence, failure by railroad company to safely maintain tracks).

Railroads may require that the public agency commit to a "full faith and credit" indemnification for the railroad company before they agree to allow passenger rail service to operate on their tracks. This means that the public agency commits its full range of resources, including public funds, to cover and protect the railroad company from any claims. If the insurance maintained by the public agency owner/operator is not sufficient to cover claims related to the passenger rail service, then it would have to use public funds to cover the gap.

Generally, liability issues are governed by state law unless there are applicable Federal law provisions, such as the Amtrak Reform and Accountability Act of 1997. Passenger rail operators (or sponsors) typically carry commercial liability insurance, with varying levels of coverage and a self-insured retention (or deductible). Recently, several large railroads have sought coverage in the range of \$300 to \$500 million.

The Ohio Revised Code, in Section 4981.033, includes the following provisions and requirements for liability insurance for commuter rail operations:

- Requires any railroad company, public agency, or other person operating passenger rail service on a right-of-way owned or used by another entity to indemnify and hold harmless for the owner or other user for:
    (1) liability for any damages, claims for damages arising out of its passenger operations

(2) all claims for damages for harm arising from any accident or incident occurring in connection with the passenger operations

(The provision above does not apply if the right-of-way owner “committed an act or omission with reckless, wanton, willful, or gross negligence and the act or omission proximately caused the harm in question.” This provision leaves the door open for freight rail companies that own the tracks, over which the passenger service is operated, to be held liable in the event of an accident. The Ohio statute may not give track owners the protections they would want to allow passenger rail service on their tracks.)

- Requires public or private entity/agency operating passenger rail service on a right-of-way owned to maintain an aggregate limit of liability coverage of at least $200 million.
- Limits the total liability for damages for harm, including any punitive damages, of the owner of the tracks over which the commuter rail service is operated to an amount equivalent to the liability coverage maintained by the passenger service operator.

6.3.2 Sovereign Immunity

Formerly, the doctrine of sovereign immunity was an insurmountable defense for a government agency or its public employees against a tort action. (Tort action" means a civil action for damages for injury, death, or loss to person or property.) The courts typically accorded sovereign immunity to cities and units of local government. However, in recent decades, state supreme courts and legislatures began to overturn the doctrine. Like most states, Ohio has waived its immunity to liability and has consented to being sued (Revised Code 2743.02). The court of claims was created to handle all civil suits filed against the state made possible by the waiver of immunity. The Revised Code sets forth the general liabilities and defenses of political subdivisions within Ohio, including regional transit authorities.

The Ohio Revised Code is quite complex in regards to the applicability of sovereign immunity and its implications for the type of ownership/operating scenario under which commuter rail service would be provided. Liability would be primarily determined on a case-by-case basis, and consultation with an attorney would be required for a definitive assessment of the status of immunity in any particular situation.

- A political subdivision, as defined by the Revised Code, is *not liable in* damages in a civil action for injury, death, or loss to persons or property allegedly caused by any act or omission of the political subdivision or an employee of the political subdivision in connection with a governmental or *proprietary* function (2744.02). Proprietary function includes “The establishment, maintenance, and operation of a utility, including, but not limited to, a light, gas, power, or heat plant, *a railroad, a busline or other transit company,* an airport, and a municipal corporation water supply system.” (2744.01)
- Political subdivisions can be held liable in certain circumstances, and according to the Revised Code, “are liable for injury, death, or loss to persons or property caused by the negligent performance of acts by their employees with respect to proprietary functions of the political subdivisions.” (2744.02)
- Sections 2744.02 and 2744.03 includes specific provisions describing the circumstances under which a political subdivision or an employee are liable or are immune from liability.

Political subdivisions are immune from liability for punitive damages. (Punitive damages are meant to punish the responsible party.)

- In some states, sovereign immunity may be compromised if an agency is self-insured or maintains any other type of insurance coverage. The Ohio Revised Code does allow for political subdivisions to maintain insurance or to be self-insured, without waiving immunity accorded by other provisions in the Code.

6.3.3 Federal Legislation

As part of the Amtrak Reform and Accountability Act of 1997 (49 USC 28103), Congress enacted a statutory limit on passenger rail liability. The statute provides that the maximum amount of damages recoverable on all claims made as a result of a single accident or incident is capped at $200 million. The cap applies only to claims by passengers and does not affect liability for damages to communities, the environment or non-passengers involved in rail accidents (such as those at rail crossings). For example, in Massachusetts, legislation has been enacted that limits the liability of the Massachusetts Bay Transportation Authority (MBTA) for any and all claims related to its commuter service to the coverage limits of its insurance policy.

Punitive damages per personal injury or property damage may only be awarded against commuter rail operators if there is clear and convincing evidence that harm resulted from flagrant indifference to the rights and safety of others. Although the provision was enacted as part of the Amtrak legislation, it applies to all passenger rail service in the United States, and seems to provide Amtrak and other passenger rail operators with significant liability protection. Amtrak continues to hold insurance coverage above $200 million out of concern that the statute may not cover all potential risks created by operation of its passenger trail service and related activities.

6.3.4 Liability Insurance Maintained by Other Commuter Rail Operators

The Northern Indiana Commuter Transportation District (NICTD) maintains general liability coverage of $50 million, with $45 million in excess of $5 million provided through Lloyds of London. For the sub-$5 million layer, NICTD participates in Indiana's State Catastrophic Liability Management Fund. For this, NICTD pays into a fund with other municipal agencies, pooling its risk and being provided insurance through the State.

New Jersey Transit self-insures the first $5 million of exposure and maintains general liability coverage up to $250 million. The insurance is purchased through a group of underwriters in Bermuda.

The Northern Virginia Transportation Commission and the Potomac and Rappahannock Transportation Commission (collectively, "the Commissions") operate the Virginia Railway Express (VRE) commuter rail service in the Washington, D.C. area. Under the Operating Access Agreements with CSX Transportation and Norfolk Southern Corporation, the Commissions are required to maintain liability insurance with an annual aggregate limit of at least $200 million (with a $5 million self-insurance limit). This obligation has been satisfied through the establishment of a State-approved Liability Insurance Plan. Under the Plan the Commissions created an Insurance Fund. The State made a one-time contribution to the Fund and the Commissions make periodic deposits into the Fund. This money is then used to fund the Insurance Plan, which consists of self-insurance reserves, investments and purchased insurance. The Virginia Division of Risk Management, including approval of the Plan and processing and managing claims, manages the Insurance Plan. This has proved to be less costly alternative to the Commissions than procuring such a large amount of liability coverage on the open market.

The table below shows the liability insurance maintained by VRE and associated costs.

Table 6.3.1
Insurance Coverage Maintained by VRE

Insurance Type	Amount of Coverage	Annual Premium
Self-Insured (1)	$5 million	Not Applicable
Commercial	$20 million	$1 million
Captive (Ace) (2)	$75 million	$750,000
Captive (XL)	$100 million	$500,000
	$200,000,000 total coverage	$2,250,000 annual cost

6.4 ROLLING STOCK STRATEGY

Rolling stock – the vehicles used to transport passengers on the railroad – will account for approximately 20 to 25 percent of the total capital cost of implementing commuter rail in Northeast Ohio. The type of rolling stock selected also will have a bearing over the long term on the recurring costs to operate and maintain the system.

Factors to be weighed in developing a strategy for the acquisition and maintenance of rolling stock include:
- Capacity – seated and crush-loaded capacity
- FRA compliance for buff strength (extent of protection in head-on collisions)
- Physical dimensions, with respect to clearance limitations
- Performance (acceleration, braking, maximum speed, horsepower, tractive effort, ability to negotiate curves and grades)
- Cab signal equipment, for use in territory with speeds of 80 mph and above (locomotives and cab cars only)
- Cost – for initial acquisition and ongoing maintenance
- Reliability
- Maintenance requirements – for inspection, servicing and routine maintenance
- Compatibility and interchangeability – standardized versus “mix and match” fleet
- Technological risk, associated with unproven technology or premature obsolescence

- Ease of boarding and alighting and impact on station dwell time, including any requirement for high-platform boarding (unlikely in NEORail territory)
- Accessibility of the cars to mobility-impaired persons, under the Americans with Disabilities Act (ADA)
- Passenger comfort and level of amenity – including seat and upholstery design, seat spacing, rest rooms, and other possible amenities such as work tables, power outlets, and telephones.

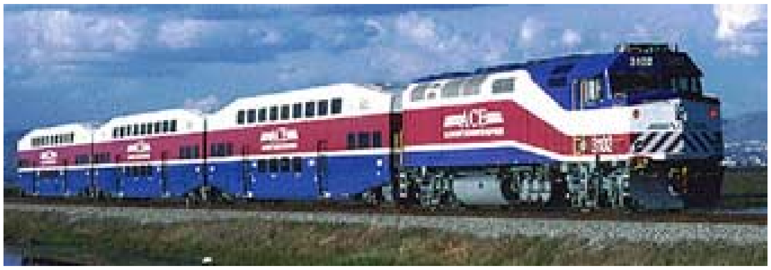
The NEORail II Study has focused on identifying an appropriate capital cost for trainsets to use in the evaluation of alternative routes and networks. Where necessary, assumptions have been made relative to certain of these other factors, as noted below. However, the actual identification and selection of the appropriate vehicle types, characteristics and procurement method will occur much later in the implementation process.

6.4.1 Vehicle Types

There are two fundamental types of rolling stock that can be considered for commuter rail service in Northeast Ohio: locomotive-hauled trainsets (usually in the “traditional” push-pull configuration), and diesel multiple unit trainsets.

Push-Pull: This “traditional” style of commuter rail equipment comprises a diesel locomotive hauling commuter rail coaches. A typical push-pull train is shown in Figure 6.4.1. The “push-pull” configuration is one in which the locomotive remains at the same end of the train, pulling a set of coaches in one direction and pushing them while operating in the opposite direction. A cab control car is situated at the opposite end of the train from the locomotive, with operating controls in the cab end where the engineer can operate the train while in “push” mode. This method of operation has been proven to be operationally efficient and cost-effective on existing commuter rail systems and has been selected for use on most of the relatively new systems, such as in Los Angeles, San Diego, San Jose, Seattle, and southern Florida.

Figure 6.4.1
Typical Push-Pull Train



DMU: Diesel multiple units are self-propelled rail cars that can be coupled into trainsets, with each unit having its own diesel propulsion system. They can have many of the characteristics of light rail vehicles, except that they are powered by diesel engines instead of drawing electricity from overhead wires. DMU trains do not require locomotives. A typical configuration for a new generation DMU train is shown in Figure 6.4.2.

In this analysis, electrified operations are not considered to be a viable option for Northeast Ohio. The only existing electrified commuter rail operations are in the Northeast Corridor between Boston and Washington, DC and on a relatively small portion of the Chicago commuter network. Virtually all other existing and planned systems, including all of the commuter rail new start projects over the past 20 years, are based on traditional diesel locomotives or diesel multiple unit trains. Wherever it has been studied in the recent past, electrification has proven to be a substantially more costly alternative to diesel propulsion. In Northeast Ohio, the freight railroads who own most of the rights-of-way over which commuter trains would operate are not interested in the electrification of portions of their lines, largely because of the additional and more complex right-of-way maintenance and the potential worker-safety hazards of performing track-side operations and maintenance tasks in electrified territory.

Figure 6.4.2
Diesel Multiple Unit Train

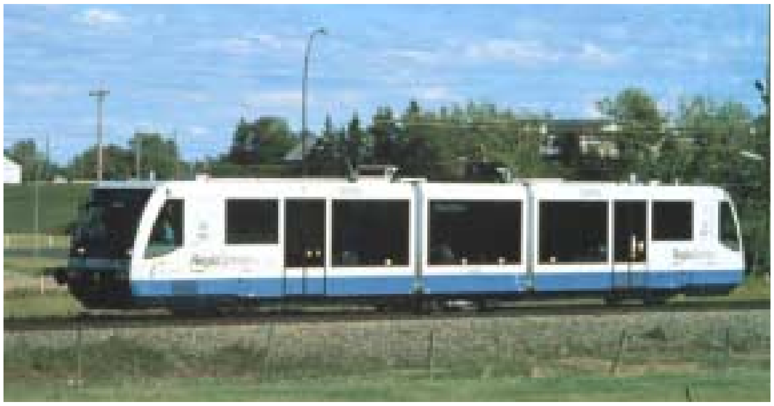


Table 6.4.1 presents an overview of rolling stock technology options and characteristics, for several variations of the two basic types of rolling stock that might be employed in Northeast Ohio service. All of the options in this list are based on use of diesel engines. Of the three types of DMUs listed in the table, only Type I meets Federal Railroad Administration (FRA) requirements for operation on tracks also used by freight trains. These requirements mainly deal with safety issues, specifically the structural strength of the car body frame. Types II and III are vehicles with a lighter construction, akin to light rail vehicles except for the on-board diesel propulsion system. None of these DMU types currently are in active use in the U.S. The four types of traditional push-pull trainsets are distinguished by four different passenger coach designs. All U.S. commuter railroads employ one or more of these car configurations, although seating capacities and interior designs vary from property to property.

Table 6.4.1
Generic Rolling Stock Characteristics

	Diesel Multiple Units (DMU)			**Commuter Rail Traditional Push-Pull (Locomotive-hauled coaches)**			
	Type III (LRT Compatible)	**Type II (LRT Compatible)**	**Type I (FRA Compatible)**				
VEHICLES	Low Floor (up to 100%) Articulated Car	Low Floor (70%) Articulated Car	High Floor Single Body Car	Single Level	Bi-Level		
Sample Manufacturer	*Adtranz GTW 6/2*	*Siemens Regio Sprinter*	*Nippon Sharyo North American DMU*	*Bombardier Comet (e.g., NJT)*	*Kawasaki (e.g., MARC, VRE)*	*Bombardier (e.g., Metrolink, Tri-Rail)*	*Bombardier (e.g., Caltrain, METRA)*
Boarding	Floor Level (Low)	Floor Level (Low)	Floor Level (High) or Steps with Traps	Single Level Floor Level (High) or Steps with Traps	Bi-Level Floor Level (High) or Steps with traps	Bi-Level Floor Level (Low)	Bi-Level Floor Level (Low)
Length	103’ (max. over couplers)	82’	85’				
Width (at floor)	9.8’	9.8’	10.5’	Single-Level 10.5’	Bi-Level 9.8’		
Height (roof)	12.8’	11.0’	13.1”	Single-Level 12.7’	Bi-Level 15.9’		
Floor Height (above guideway)	22”	21”	51”	Single-Level 51”	Bi-Level 25”		
Capacity				Single-Level	Bi-Level		
Seated	137	84	90	113	142		
Standing	93	100	34	43/44	109		
Total	230	184	124	156	251		
FARE COLLECTION	Proof of Payment	Proof of Payment	Proof of Payment or Conductor On-Board Collection				
STATIONS							
Platform Length	300’ min.	300’ min.	300’ min.				
Platform Width							
Center	15’ / 12’ min	15’ / 12’ min	15’ / 12’ min				
Side	10’ / 8’ min.	10’ / 8’ min.	10’ / 8’ min				
Platform Height above running surface (rail)	22” (for floor-level boarding)	21” (for floor-level boarding)	Low-Level: 8” High-Level: 51”				
ALIGNMENT							
Conditions	Combinations of Urban Street or RR R/W with grade xings	Primarily RR R/W with grade xings (Urban Street running curve limited)	Railroad right of way, with grade xings				
Min. Width			x				
Double track	24’	24’					
Single track	15’	15’					
Minimum Radius							
Horizontal Curve	131.2’ des. min.	263’ des. min.	480’ min. desirable, 300’ design minimum				
Vertical Curve	Crest:1640 ft Sag: 1312 ft						
Grades	6.0%	4.0 %	2.5%				
Minimum vertical clearance above top of	18’ min. in public way 16’ absolute min. 22’ min. in RR R/W		22’ min. in RR R/W				
PROPULSION	Diesel-Electric Self-Propelled (fuel for IC generators carried on board)			Hauled by separate Diesel-Electric Locomotive (fuel for IC generator carried aboard)			

6.4.2 Vehicle Characteristics, Advantages and Disadvantages – Traditional

Commuter railroads in Chicago and on the west coast almost exclusively use bi-level coaches, which have with an upper and lower seating level. Bi-levels are relatively efficient because they maximize the seated passenger load per car and minimize required train lengths. The recent trend on the east coast has also been in the direction of buying bi-level equipment, although these vehicles typically have smaller capacities and lower headroom because the minimum height clearances above the track are lower than in the Midwest or on the west coast. Single-level coaches also are prevalent, particularly in the Northeast.

There are three generic types of bi-level coach that could potentially serve the NEORail network:

- Go Transit car – initially developed for Toronto and subsequently adopted for use in Florida (Tri-Rail) and on the west coast (San Diego, Los Angeles, San Jose and Seattle)
- Gallery car – used in Chicago and on the Caltrain (San Francisco) line
- East Coast bi-level – used in Massachusetts, New York, Maryland and Virginia.

Table 6.4.1 highlights some of the characteristics of these coaches and the major differences among them. Either the GO or Gallery type car would be suitable for the NEORail network, which will have low platform stations (because of the need to operate passenger and freight trains on the same tracks). The high-level platforming capability of the east coast bi-levels is unneeded, and the process of boarding and alighting from a train using the traps on these coaches is considerably slower and more awkward than on the GO or Gallery cars.

For new purchases, bi-level equipment is assumed in the NEORail study, since most new industry orders in the foreseeable future are expected to be for bi-level equipment.

In the second-hand market, either bi-level or single level equipment would be acceptable. Several existing systems, in fact, mix and match single level and bi-level equipment, even on the same train (e.g., MBTA in Boston and MARC in Maryland).

Relative to DMUs, traditional commuter rail equipment offers tried and true, highly reliable technology. There is a well-established market for this type of equipment in the U.S. The chief disadvantages are the need for a minimum of a two-person crew (an engineer and a conductor) to operate each train, and the relatively high cost per rider of buying and operating locomotives to haul short trains carrying relatively light passenger loads.

6.4.3 Vehicle Characteristics, Advantages and Disadvantages – DMU

Diesel multiple-unit or DMU technology offers potential cost savings for relatively low-density commuter lines, but these vehicles are not currently common among U.S. commuter rail operators. This type of equipment is common in Europe and typically is of lighter construction than traditional U.S. rail cars. Most existing equipment does not meet the Federal Railroad Administration's safety criteria and therefore cannot operate on rail lines where freight trains or other passenger trains are operating. Refurbished rail diesel cars (RDCs) were used for the new start-up commuter service in the Dallas-Fort Worth area, although this system is transitioning to the use of traditional equipment. The heavy density of daytime freight traffic on the main lines feeding Cleveland effectively precludes the use of lightweight DMUs on most of the routes considered in the NEORAIL analysis. A new generation of FRA-compliant DMU vehicles is being developed, but none are yet in revenue service within the U.S.

Relative to traditional push-pull equipment, DMUs offer the possibility of single-operator service (akin to a light rail train, where the train operator also opens and closes the train doors and, in some cases, checks the tickets of boarding passengers). In short trains, DMUs can have lower operating costs than traditional trains. Per unit, DMUs have a significantly higher capital cost than traditional rail coaches. This is due both to the additional propulsion-related equipment on-board a DMU and to the fact that the modern DMU market is relatively new, and these vehicles have not yet made it into mass production. However, by avoiding the cost of separate locomotives, the capital cost of DMU trainsets can be competitive with or lower than the cost of traditional trainsets, provided the train lengths are short enough (typically two to four cars per train).

Another disadvantage of DMUs is the somewhat experimental nature of the vehicles on the market at the present time, without an established maintenance history and no historical information on reliability and performance. In addition, even with FRA-compliant technology, the freight railroads may be more reluctant to agree to share tracks with DMU trains than with traditional push-pull trains.

6.4.4 Procurement Options

Newly built locomotives, cab cars and coaches can be acquired from several manufacturers, or they can be acquired second-hand from other commuter rail system owners as a way to lower the initial capital cost. These second-hand units are often “remanufactured,” where virtually all new components are installed on a pre-existing car body shell or chassis. Many of these remanufactured units are still in productive service more than 50 years from their original date of construction.

Equipment can be purchased or leased. Leasing of rolling stock is one way to reduce the initial capital cost of implementing commuter rail in Northeast Ohio, although lease payments would add to the ongoing cost of running the operation.

If the decision is made to purchase new vehicles, the most economical option is to adopt an existing, standardized design in use elsewhere in North America and “piggyback” onto an order from another commuter rail property. There is a relatively continual market for capital replacement of coaches and passenger locomotives, as well as new purchases to support line extensions, ridership growth and new start-up systems. Some flexibility will be lost with respect to on-board features and timing of receipt of the vehicles, but this approach will likely yield the lowest unit cost per vehicle.

6.4.5 NEORail II Assumptions and Recommendations

The NEORAIL Study analysis assumed that commuter rail service in each of the seven potentially feasible routes would employ “traditional” commuter rail equipment – comprising diesel locomotives hauling commuter rail coaches, in a “push-pull” configuration. Generally, the ridership estimates have shown that three to four-car trains, with a locomotive, will be capable of handling the projected peak passenger loads.

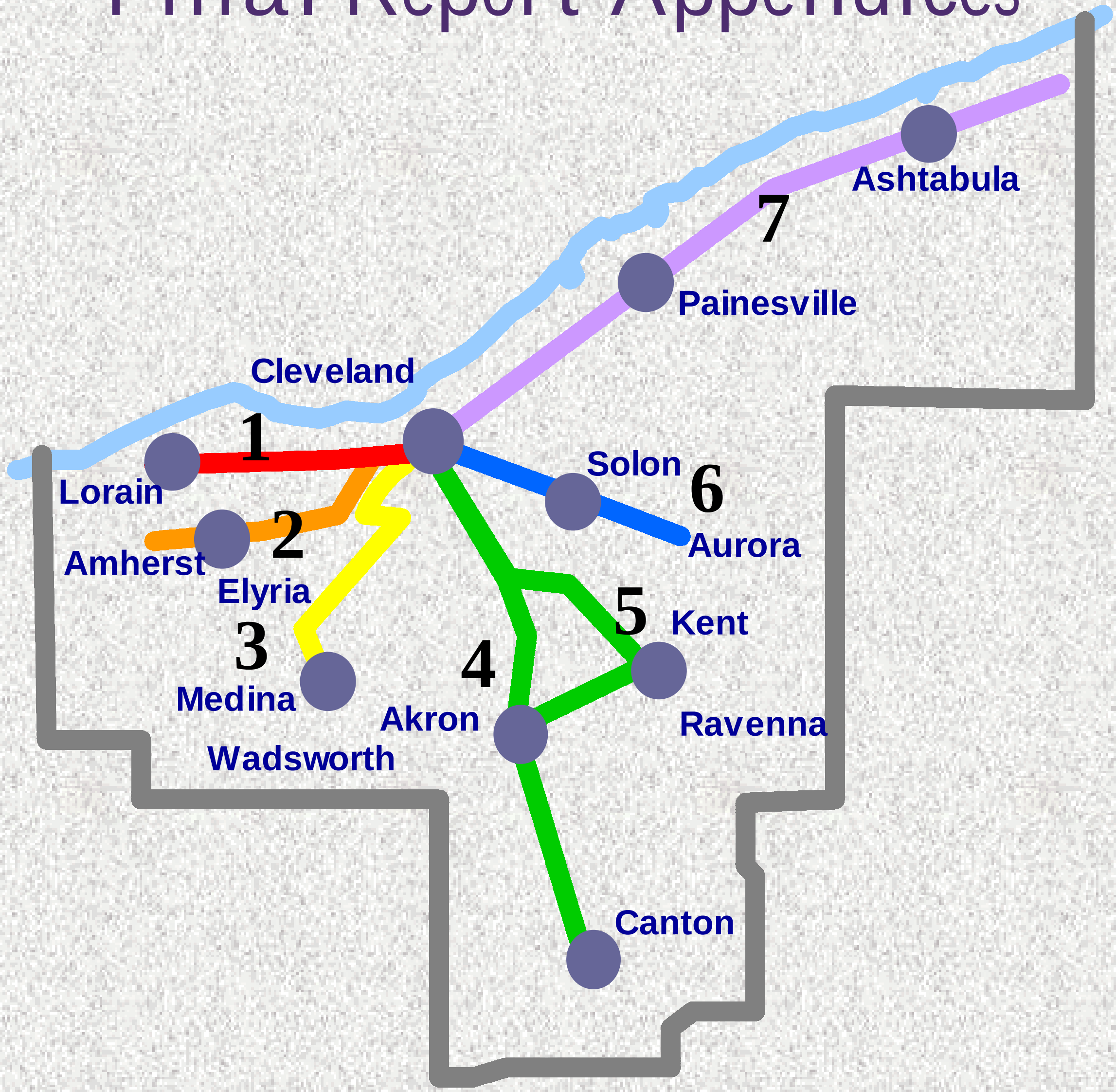
The NEORail II analysis assumes a capital cost of $10 million for purchase of a new 3-car trainset. Buying used or remanufactured equipment could bring the cost of initial implementation down

Therefore, the NEORAIL Study has assumed traditional commuter rail rolling stock in its assessment of the feasibility of the commuter rail mode in Northeast Ohio. FRA-compliant DMUs are a technology option on all NEORail routes. Non-compliant DMUs have been identified as a technology option for corridors where tracks are dedicated for commuter use or where freight access can be limited to hours when the DMUs are not operating (e.g., late night). These conditions would only be practical for Route 6, if a dedicated commuter track were to be constructed between the NCTC and Erie Crossing.

Should a decision be made to proceed with implementation of commuter rail on any route(s) in Northeast Ohio, a review of available rolling stock options should be undertaken to determine the most appropriate and cost-effective technology option.

NEORail - Phase II

Final Report Appendices



December 2001

Submitted to NOACA by PARSONS BRINCKERHOFF for the Northeast Ohio Commuter Rail Feasibility Study – Phase II

Appendix A:
Commuter Rail Advisory Committee (CRAC)

1. CRAC Members
2. Meeting Agendas: February 2000 – May 2001
3. NEORail Phase II Goals and Objectives
4. CRAC Final Recommendations

Commuter Rail Advisory Committee (CRAC) Members

Ashtabula County – Hon. Robert Boggs

Cuyahoga County – Norman Krumholtz, Robert Landgraf, Edward Thellman

Geauga County – Jack Jackson

Lake County – William Snow

Lorain County – Calvin Waite (Chairman)

Medina County – R. Christopher Themes

Portage County – Hon. Christopher Smeiles

Stark County – Paul Jaeger

Summit County – Warren Woolford

City of Akron – Hon Donald Plusquellic

City of Cleveland – Hunter Morrison, Christopher Warren

GCRTA – Joseph Calabrese

LAKETRAN – Frank Polivka

METRO RTA – Robert Pfaff

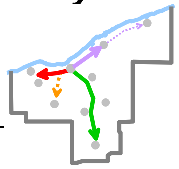
Greater Cleveland Growth Association – David Goss

Akron Regional Development Board – Robert Refner

Ohio Department of Transportation – Jerry Workman

Ohio Rail Development Commission – James Seney

Northeast Ohio Commuter Rail
Feasibility Study Phase II



Commuter Rail Advisory Committee
Agenda

April 19, 2000

- **Public Participation Plan**
- **Travel Demand Forecasting Plan/Schedule**
- **Railroad Coordination**
- **Initial Technical Tasks**
  - Routes, stations
  - Costs, investment solutions
  - Operating plans
- **Phase I Recommendations**
- **Early Tiering**
- **Evaluation Criteria**
- **Next Steps**

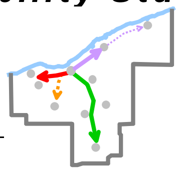
Commuter Rail
Advisory Committee Agenda
May 17, 2000

- **Public / Stakeholder Involvement Plan**
- **Early Tiering**
- **Goals / Evaluation Criteria**
- **Travel Demand Forecasting / Stated Preference Survey**
- **Routes and Stations**
  - ⇒ Cleveland
  - ⇒ Lake West, West
  - ⇒ Other Routes
- **Transportation/ Land Use**
- **Tier II Routes?**
- **Technical Work**
- **June Meeting**

Commuter Rail Advisory Committee
Agenda
June 21, 2000

- ❖ **Public / Stakeholder Involvement**
- ❖ **Commuter-Freight Conflicts**
- ❖ **Capital Costs / Investment Solutions**
- ❖ **Operating Plans**
- ❖ **Railroad Coordination**
- ❖ **Travel Demand Forecasting**

Northeast Ohio Commuter Rail
Feasibility Study Phase II



Commuter Rail Advisory Committee Agenda

July 19, 2000

- **Overview and agenda**
- **Stakeholder interviews**
- **Land use guidelines**
- **Railroad coordination**
- **Infrastructure and operation**

Commuter Rail Advisory Committee Agendas

August 16, 2000

- Public Involvement: Stakeholder interviews
- Stations: locations and sites
- Tiering
- The Bridge
- Next steps

September 20, 2000

- Technical Workshop

Northeast Ohio Commuter Rail
Feasibility Study Phase II

Commuter Rail

Advisory Committee Agenda

September 20, 2000

- **Stakeholder Interviews**

- **Service Options: Corridors and Systems**

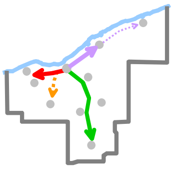
- **Capital Costs/Investment Solutions**

- **Workshop: Decision-Making Process**

- **Next steps**
  - **traffic impact**
  - **land use impact**
  - **railroad coordination: Phase II**
  - **financing**
  - **governance**
  - **MIS alternatives**

- **Next Meeting: October 18th**

Northeast Ohio Commuter Rail
Feasibility Study Phase II



Commuter Rail Advisory Committee Meeting

November15, 2000 - 1:30 pm at NOACA

AGENDA

❖ Project Management Issues

❖ Travel Demand Forecasts - Status

❖ Operations and Engineering Review

- Purpose and Context of Analysis
- Network Overview
- Service Planning Assumptions, Operations and Investment Requirements – East Side Routes
- Service Planning Assumptions, Operations and Investment Requirements – West Side Routes
- Rail Infrastructure Configurations and Engineering Solutions at Key Locations
- Route Combinations

❖ Workshop Overview

❖ Next Steps

- Reviews and Decisions
- Outreach
- Railroad Discussions
- Coordination with Other Work Efforts
- Implementation Plan

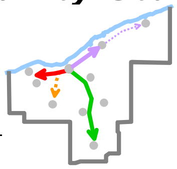
Northeast Ohio Commuter Rail
Feasibility Study Phase II

Commuter Rail Advisory Committee Meeting

December 20, 2000 - 1:30 pm at NOACA

AGENDA

- **Project Schedule**
- **Public/Stakeholder Involvement**
- **Travel Demand Forecasting – Preliminary Results**
- **Capital and Operating Cost Estimates**
- **‘Tiering’ Workshop – January 17, 2001**



Commuter Rail Advisory Committee
Tiering Workshop Agenda

January 17, 2001

Pre-Meeting: **Coffee, tea & treats**
Team Assignments

❖ **9:00 a.m.** **Workshop Introduction & Game Plan**

❖ **9:15** **Review of Data & Ratings**
Questions of Clarification

❖ **10:00** **Exercise 1: Affirmation of Ratings (Full Group)**

❖ **10:45** **Presentation of Recommended Tiering Scenarios**

❖ **11:30** **Exercise 2: Tiering Workshop (Teams)**
Assess recommended tiering & develop modifications and alternate scenarios

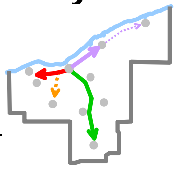
Working Lunch

❖ **1:30 p.m.** **Team Presentations**

❖ **2:00** **Full group discussion to reach consensus on recommended tiering**

❖ **3:00** **Adjournment**

Northeast Ohio Commuter Rail
Feasibility Study Phase II



Commuter Rail Advisory Committee Meeting

Agenda - February 21, 2001

- **Public Meetings**
  - What have we heard thus far?
- **Station Sites**
  - Route 1: Cleveland – Lorain
  - Route 6: Cleveland-Aurora-Mantua
- **O&M Costs and Farebox Revenues**
- **Implementation**
  - Governance and Finance

****** Special Request: Please bring copies of articles from your local newspapers regarding the CRAC "Tiering" recommendation and the public meetings that have been held for the study files. Thank you.

Northeast Ohio Commuter Rail
Feasibility Study Phase II

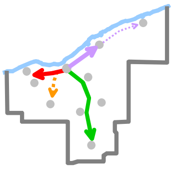
Commuter Rail Advisory Committee Meeting

March 21, 2001 - 1:30 pm at NOACA

AGENDA

- Report on Public Meetings
- Reaffirmation of the Tiering Recommendations
- Finance and Governance
- Tier 2 stations
- Lift Bridge

Northeast Ohio Commuter Rail
Feasibility Study Phase II



Commuter Rail Advisory Committee Meeting

April 18, 2001 - 1:30 pm at NOACA

AGENDA

- **Regional Benefits**
- **Lift Bridge**
- **Liability Insurance**
- **Follow up on Finance and Governance**
- **CRAC Recommendations**

NEORAIL PHASE II GOALS & OBJECTIVES

GOALS

- Identify commuter rail corridors which are potentially feasible to implement in Northeast Ohio;
- Produce and Implementation Plan which will provide regional decision-makers with all necessary information to participate in an informed discussion on commuter rail in Northeast Ohio;
- Assess the opportunity for commuter rail service to advance regional Transportation Plans; and
- Provide information on the feasibility of commuter rail as an alternative for consideration and evaluation by the Boards of the participating Metropolitan Planning Organizations as regional Transportation Plans are updated.

OBJECTIVES

- Complete analysis of corridors identified as potentially feasible in Phase I of this Study;
- Prepare final ridership (future) demand, equipment options, station locations and associated land use considerations, least-cost solutions to major capital impediments, and other operating and cost characteristics. Address local issues identified in Phase I;
- Address all the issues related to commuter rail start-up in a comprehensive plan. The plan should contain information in sufficient detail to answer complex issues such as phased development, capital cost scheduling and resources, ownership/operation, regional fiscal capacity to provide funding of capital and continuing operating costs;
- Determine if the implementation of commuter rail service will impact the MPO’s adopted Transportation Plans and programs and the goals which guide their development; and
- Conclude Phase II with a recommendation(s) as to whether commuter rail is a viable, cost-effective transportation option that should be considered for implementation through inclusion on the regions’ Transportation Plans.

Commuter Rail Advisory Committee Final Recommendations

Adopted May 30, 2001

As a result of the Northeast Ohio Commuter Rail Feasibility Study (*NEORail*), Phase II, the Commuter Rail Advisory Committee recommends that the Board of the Northeast Ohio Areawide Coordinating Agency (NOACA), the Policy Committee of the Akron Metropolitan Area Transportation Study (AMATS), and the Policy Committee of the Stark County Area Transportation Study (SCATS) take the following actions:

1. Accept the findings of the *NEORail* Phase II Study, and forward the results to the counties, townships, cities, and regional transit authorities in the nine-county study area.
2. Advance the concept of commuter rail for Northeast Ohio by endorsing further exploration of the commuter rail system recommended in the *NEORail* Phase II Final Report (see attached map) by:
    - Facilitating efforts of interested and affected public officials from the nine-county study area to continue the public dialogue on implementation of commuter rail in northeast Ohio.
    - Assisting in formation of regionally based or corridor based committees organized to oversee the following steps:
        - Review the findings in the *NEORail* Phase II Final Report and assess current conditions;
        - Evaluate and recommend funding and governance plan;
        - Obtain necessary local and regional support for commuter rail funding and operations;
        - Coordinate commuter rail planning and development with state, regional and local transportation agencies;
        - Guide continued discussion and coordination with the affected railroads as well as monitor other passenger rail initiatives for possible cost sharing and service opportunities;
        - Provide on-going policy direction until such time as a more permanent governing body is established; and
        - Secure funding for further planning including possible Alternatives Analysis studies.
3. Participate in Alternatives Analysis Study(s) of the commuter rail corridors recommended in the *NEORail* Phase II Final Report as initiated by the regional/corridor committees.
4. Create a Regional Rail Committee including membership from the *NEORail* study area, with the following responsibilities:
    - Provide regular reports to the Transportation Advisory Committees and Policy Boards/Committees of NOACA, AMATS and SCATS on passenger and freight rail issues impacting northeast Ohio
    - Monitor the status of regionally significant rail rights-of-way and provide recommendations on efforts to preserve these facilities for regional transportation options
    - Assist MPO staff in development of passenger and freight railroad policies and programs

Appendix B:

Public Involvement

1. Stakeholder Handouts
2. Stakeholder Comments
3. Route Summary Handouts
4. Newsletter
5. Public Meeting Q/A

NEORail II Briefing Sheet

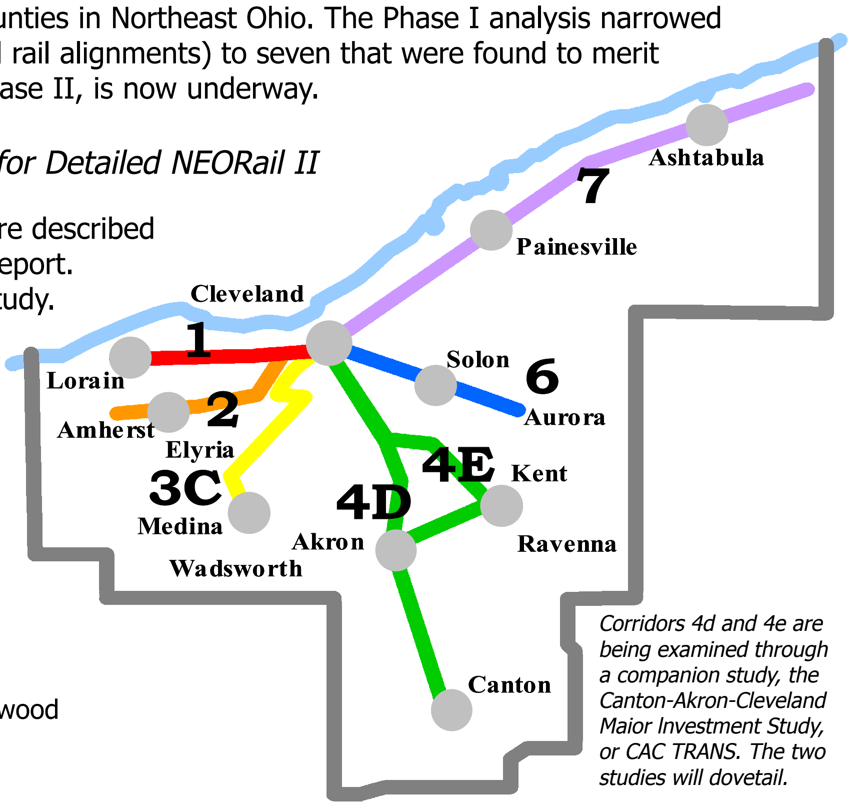
Northeast Ohio Commuter Rail Feasibility Study
Phase II
Briefing Sheet #1 ◆ July-August 2000

7 Commuter Rail Routes Studied for Feasibility

The Northeast Ohio Commuter Rail Feasibility Study, or "NEORail," began in 1998 with a Phase I study of 10 potential commuter rail corridors in nine counties in Northeast Ohio. The Phase I analysis narrowed the list of 10 corridors (containing 38 individual rail alignments) to seven that were found to merit further investigation. That process,NEORail Phase II, is now underway.

NEORail I Provides 'Starting Point' Factors for Detailed NEORail II

The seven corridors being studied (see map) are described below with data that appeared in the Phase I report. They form the starting point for the Phase II study. Ridership estimates were based on 1990 census data; for Phase II, ridership will be projected to the year 2025. Costs shown below are at the sketch planning level; more detailed data will be used to refine them for Phase II.



Corridors 4d and 4e are being examined through a companion study, the Canton-Akron-Cleveland Maior Investment Study, or CAC TRANS. The two studies will dovetail.

1 Lake West
Daily ridership range: 1,680 -2,910
CapitalCosts $73million - $210million
Costs/O&M $ 4.6million - $7million
Issues: Agreement limits future freight traffic; Lakewood grade crossings; Cuyahoga River crossing capacity

2 West (figures below to Amherst)
Daily ridership range: 1,990 -3,460
Capital Costs $76million -$243million
Costs/O&M $ 4.9million - $7.7m
Issues: Heavy freight traffic; Cuyahoga River crossing capacity

3c Southwest (figures below to Medina)
Daily ridership range: 1,340 - 2,340
Capital Costs $170 m - $325 m
Costs/O&M $ 5m - $ 8m
Issues: NS-CSXconnection; Cuyahoga River crossing capacity

4d South to Canton via Hudson
Daily ridership range: 860 -2,440
CapitalCosts $150 m - $420 m
Costs/O&M $ 6.4 m -$10.1 m
Issues: Higher ridership/higher cost; Heavy freight traffic on NS Cleveland Line; Motor yard; CSX crossing at Akron

4e South to Canton via Kent
Daily ridership range: 1,000 - 2,810
Capital Costs $190 m - $402 m
Costs/O&M $ 6.6m - $11.9m
Issues: Higher ridership/higher cost; Shorter distance via NS Cleveland Line; WLE upgrade; Kent connection

6 East
Daily ridership range: 760 -1,210
Capital Costs $84m -$187m
Costs/O&M $4.4m- $6.4m
Issues: Relatively easy to implement; Lower ridership potential; Potential non-commuter markets

7 Lake East (figures below to Conneaut)
Daily ridership range: 1,900 -3,550
Capital Costs $86m - $221m
Costs/O&M $ 6.7m - $10.2m
Issues: Heavy freight traffic, CSX Collinwood Yard

Implementation Plan to Aid Decisions by 9 Counties, 3 Planning Agencies

NOACA has contracted with a consulting team led by Parsons Brinckerhoff, whose products will include a recommended implementation plan that will help local decision-makers determine whether, which and when any of the seven corridors should be developed for commuter rail.
In consultation with key stakeholders, groups and the general public, PB will develop a plan that includes:

- Criteria for selection/prioritization of commuter rail routes
- Final ridership estimates, final cost estimates (Capital,
- Operations & Maintenance), projected revenue
- Operating plan for a recommended rail system, including station locations, equipment needs, operating schedule and integration with existing bus and light rail systems
- Recommended organizational plan (what new or existing agency or agencies would operate the system)
- Funding plan; assessment of regional fiscal capacity and of compliance with federal programs/criteria
- Assessment of liability insurance issues; recommendations for resolution as needed
- Assessment of local and regional impacts

SPONSORING AGENCIES, COUNTIES

NEORail II is sponsored by NOACA, the Northeast Ohio Areawide Coordinating Agency (serving Cuyahoga, Geauga, Lake, Lorain and Medina Counties), in partnership with two other Metropolitan Planning Organizations: AMATS(Akron Metropolitan Area Transportation Study, serving Summit and Portage Counties) and SCATS (Stark County Area Transportation Study). Ashtabula County is also included in the study.

Questions?
Contact Steve Jones at NOACA
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NEORail II Stakeholder Involvement

Summary Report On Initial Stakeholder Briefing Sessions

During the summer and fall of 2000, members of the NEORail consulting team met with 50 persons identified as stakeholders in the commuter rail planning and implementation process. The purpose of these meetings was to brief them on the NEORail Phase II study and to seek their reactions to the concept of commuter rail.

Stakeholders from all of the corridors and from all nine counties in the study area were covered by the briefings, but a review of the responses shows that respondents did not feel bound by their own locale: persons from Lakewood (the LAKE EAST corridor), for instance, did not hesitate to offer opinions on the merits of the Aurora line (WEST corridor) vs. the line passing through Kent (SOUTH via KENT). Twenty-seven separate meetings were held, most with two or more persons. Geographic distribution of the respondents' interests may be grouped roughly as follows:

- four briefings each with persons who addressed the LAKE WEST and LAKE EAST corridors
- three briefings with persons speaking on the EAST and SOUTH/KENT corridors
- three briefings each on the SOUTH/KENT and SOUTH/HUDSON routes
- one briefing each for SOUTH WEST, SOUTH/HUDSON only, SOUTH/KENT only, WEST and LAKE WEST (both), and WEST only
- five briefings with persons that spoke GENERALLY about commuter rail or about all or most of the corridors

In early meetings, respondents were almost uniformly positive about the general concept of commuter rail. As a result, the consulting team began to make the sessions "meatier," introducing the subject of implementation costs and seeking respondents' comments on the idea that a "local share" will be a necessary component of any commuter rail implementation plan.

At these briefings, respondents were told that they could take the following as a working assumption: that of the total amount needed for construction of a commuter rail system, 50 percent might come from federal sources, an additional 25 percent might come from the State of Ohio, and the final 25 percent would have to come from local sources (public and/or private). In addition, they might assume that continuing operations and maintenance would have to be paid from local sources. As a working figure, they were asked to consider an amount of about $10 million per year, per corridor, to cover O&M and the amortized construction costs.

Firm conclusions cannot be drawn from their responses, and no generalization should be made on the basis of so small a sample. The responses may, however, serve as guideposts for further exploration of public sentiment. As a recommended implementation plan gains form and substance, the concerns and issues raised here may help set a range of questions that should be asked to more accurately gauge the potential strength of public support or opposition.

The above caveat notwithstanding, the following characterized the stakeholder meetings:

- Representatives from all corridors recognized the inherent difficulty of designating a secure income stream for commuter rail, but none rejected it out-of-hand on that basis. Most voiced the belief that with the proper groundwork, local support could be achieved.
- Stakeholders interviewed from LAKE WEST, WEST, EAST AND LAKE EAST expressed strong interest in, and support for, the inclusion of their rail corridor in a commuter rail system.
- Stakeholders from the two SOUTH corridors – SOUTH via HUDSON and SOUTH via KENT – were the most sharply divided, with vehement opposition and passionate support expressed in both corridors. The same split was evidenced in the many interviews held as part of the CAC TRANS study. Public officials in Akron and Hudson are proponents of rail connections there; and public officials in Kent, as well as chief officials of Kent State University, are strong supporters of the Kent alignment.
- Comments from the SOUTH WEST corridor were unique, in that key County officials voiced extremely strong support for transit and commuter rail, both generally and in Medina County, but were unable to support the particular line under consideration in the NEORail study. The location of the line is not where the County wants to encourage development, and the right-of-way has been committed to other public uses.
- Private-sector stakeholders said they saw merit in implementing a commuter rail system for the region. But of all respondents, these same private sector individuals expressed the greatest skepticism about the success of such a

system. Some questioned whether commuter rail could attract sufficient ridership, and others felt commuter rail would be mired in political wrangling, at least for the short-term.

- One public sector representative expressed a strong desire for rail options, but voiced equally strong skepticism that rail would be supported locally, and predicted that commuter rail would get little attention while local efforts were directed at “fixing the school thing.”

A summary of comments follows below, arranged by corridor from west to east. Where possible, the speaker’s own words are used, but these notes should be read as para-phrase, not necessarily direct quotations:

LAKE WEST

- Commuter rail is a good idea. A good number of Sheffield Lake residents work in Cleveland, and might use commuter rail if it were available.
- I would recommend something to Council to help support commuter rail, but remember that Sheffield Lake is a city that’s only 3 miles long, $1^{1/2}$ miles wide, with a population of only 10,000 and with NO industry.
- Parking is going to be important, and you might find that the Village (Sheffield) has more available land than we do.
- Let’s do it! I am strongly supportive of commuter rail and confident that funding for a local share could be managed.
- Commuter rail would be a better, easier, direct route to Cleveland than driving there and paying for parking. It would be of most interest to our residents for increasing their options for getting to Cleveland for shopping, tourist attractions and entertainment. Funding would have to come from County Commissioners. [A fair amount of this short interview was spent with the official being confused at the word “hub” and his disappointment that there would not be a chance for a station in Avon Lake. When we clarified that there could be a station there, he expressed the opinions noted above.]

WEST & LAKE WEST

- We are glad to know study is going on, but have no opinion on which of the two western routes is better. Our interest is in how commuter rail might help those traditionally under-served, especially reverse commute to jobs, etc. You might touch base with the Lorain County Farm Bureau, to see if they are interested in how rail might affect rural land uses. We will be glad to convene program officers from other area foundations when you are further along in the study and have a sense of what the commuter rail recommendations will be.

- Mayors of both Elyria and Lorain are strongly supportive, with rail stations as major components of their downtown plans.
- To date, only Lorain has put any dollars forward for planning and engineering. Lorain has partnerships working with the County, mayor, Port Authority and businesses. They are also interested in excursion rail to Wellington/Oberlin [not being studied as part of the NEORail Phase II scope].
- Elyria's idea is for an intermodal facility that will partially be funded by parking fees generated by outlying people driving to Elyria to catch the train for Cleveland.

SOUTH WEST

- We are extremely positive generally about commuter rail, and we support it. However, the location of the line under consideration is not where the County wants to encourage development, and the right-of-way is being used for other priorities.
- The Lorain Rural Water Authority is building two 5 million gallon storage tanks, and have right-of-way easements to Abbeyville Road. The Park District line is now a trail. You would have to take them to court to put commuter rail here.
- The rail line doesn't coexist with the places density is, or where it's wanted. Putting the rail on this line is not consistent with the county's land use goals. We don't have sewer lines to the west, and are not trying to encourage development to the west. We want to keep more dense development to the east. You should talk with Mike Morse, president of City Council, if you want further confirmation.

SOUTH (BOTH ROUTES)

- As developers and employers, we can say that there's a definite need for better transportation systems in the area, but getting support for commuter rail is going to be difficult.
- Industries are moving out of the central core. This map of the NEORail corridors is really very interesting: it's a map of the megalopolis of the future.
- We own a health club in Hudson: we have probably 300 people in the early morning from 5:30 to 8 a.m., and 80% of them go on to Cleveland.
- How do we get people to give up their love affair with the auto? Should it be done? Absolutely. But how do we get over this hurdle? Chicago, Washington, New York: do these transit systems work because they have to?

- A major dilemma is getting affordable labor. In the last two years, 3,000 jobs have been developed in Streetsboro: this is because of the highway infrastructure.
- If you develop commuter rail, you're going to have different population groups using these lines. Who do you want? Blue collar or skilled? White collar? They may not want to sit together on a train.
- We're developing an industrial park in the Vermillion area. It is essential that people be able to go to the Massilons and connect to jobs and affordable housing.
- [Considerable talk in this meeting about the inextricable links between job sites/ affordable housing/commercial development, and the need for balance among the three. You might be able to sell commuter rail to a city on the backbone of a balanced industrial base –- getting people linked to jobs, etc. Cities "will do backflips to get industrial parks."
- I don't see this [commuter rail] happening. I don't think you'd get the ridership you need to make it run. The cost/benefit isn't there, and the risk/reward isn't there.
- Labor is a serious problem. Maybe rail could be useful if it could get us employees – but our labor is not coming from Cleveland. Other employers in Twinsburg have also tried Cleveland labor, but it didn't work. A lot of our employees come from southeast of here, such as Warren or Ravenna.

SOUTH (via HUDSON)

- Personally, I'm in favor of public transit and I am very sympathetic to the environmental goals that might be addressed in a commuter rail system. And some people in Stow and Silver Lake might even use the rail if it were in place. But many of my constituents – primarily those that live along railroad tracks they thought were abandoned -- are extremely concerned about this. They are worried that improvement of the tracks for commuter rail will also bring more freight traffic, within a few yards of their properties, and I can't blame them.

- Support is likely from elected officials, although there will be some opposition among Hudsonites, based on their proximity to the tracks. We would prefer a downtown site because this would serve as an economic catalyst. At the same time, it is a tough sell: creating something that will add more traffic through town. We have a downtown redevelopment project underway – the Morse Control property at Rtes 91 and 303.

- Another site is at Hines Hill, where the City owns land south of Hines Hill and the County owns land north: this would be a good opportunity for a Park and Ride. If it were possible to do both sites, that would be good.
- One person at this meeting expressed his concern over the potential of “two-hour waits” when trains are sharing tracks [he said he had experienced this in Boston]. It’s OK to share right-of-way, but not tracks, he said.

SOUTH (via KENT)

- We need a change in paradigm to have ODOT put the kind of dollars into transit instead of highways. Could a station & parking lot be part of a local share? Local values are very strong toward the environment. I would believe that the public would support some kind of sales tax to support transit. And you shouldn’t discount Kent State as a generator of riders – Kent is developing partnerships with Case Western and with Cleveland State. We have a potential site, could be 10 acres, where St. Clair cul-de-sacs across from Plum Creek Park.

SOUTH (via KENT) & EAST

- How about a rail link from Aurora to Kent?
- A train to Six Flags and Sea World would be a good first start, because people are so concerned about traffic congestion there. During the summer season, you might actually have more people going out of Cleveland because of all the jobs at Geauga Lake, etc.

SOUTH (BOTH ROUTES) & EAST

- We are an industrial design-build firm. Most companies are leaving Cleveland or Akron because they’ve outgrown the old facilities. Typically, they need three to eight acres and from 20,000 to 100,000 square feet. They have 20, 60, 80 employees. As they need sites, they’re coming to Hudson. In one area, we bought 150 acres and we now have only three to five acres left.
- Norstar Plastics in Solon wanted to come out here. His people took the bus to work. We got him a site in Glenwillow, but sites are gone where people now live. Public transportation is needed to get employees to work.
- Alternative solutions are needed at Six Flags. Just ask the mayor of Streetsboro.
- Portage County has a lot of developable land. Like Medina County, there are lots of options available. Along Rte 13A and Rte 44 and the Turnpike, good

sites are available. Land equals growth equals possibilities. I don't know how Kent could support this because Kent has no land.

EAST

- Bringing rail to Harper Road was seen as OK two years ago, but sentiments may have changed some. Solon is working on 600 to 700 parking spaces at a Transit Center at Harper Road and Rte 43. We had focus groups with larger employers, and found that welfare to work was an issue. We are working with RTA and with "Employment Central" at the Growth Association.
- Where you get the opposition, people are envisioning TRAINS – big, long freight trains in the middle of the night. You may find resident interest in Wards 3, 6, 7 and a piece of Ward 1, where they might be impacted by increased rail traffic.
- In terms of a local share, maybe most of it comes from the private sources. If Six Flags and Geauga Lake kicked in a substantial amount, people will say, "We're only doing this because of these amusement parks, so they should pay."
- There are seven wards in Solon, Wards 2 and 4 are not impacted, 5 is industrial, and Ward 7 is downtown (part of Ward 1, too, where there is residential at the eastern end). Specific neighborhoods to contact when you have public meetings include the Huntington neighborhood and Longview Heights. Council members to talk to are John Scott (3), Rich Mendelson (6). You should also contact Nancy Traum at the Chamber of Commerce.
- We are ready for commuter rail. Council is ready. We are proponents. This weekend at Six Flags was Cleveland Clinic weekend, and 15,000 tickets were given out: all of those people are looking for parking – if the rail were in place, they would have come that way.
- We could also do reversible lanes fairly easily. Based on our traffic counts, all of August and the last two weeks of July are the worst traffic. Wednesdays and Thursdays are bad, Saturday is probably the worse from June 15th through Labor Day.
- We already have the line being improved for freight service. Catex and American Plastics are working with the Rail Commission to put the line into a service upgrade to 10 mph. The private sector will pay ½ million.
- I'm not sure the County Commissioners will support our line over the Kent line because of Kent State's interest in having the rail there.
- We now have to drive to Green Road to get rail service into Cleveland.
- There will be opposition where the line goes through Bedford and other residential areas.

- PARTA would like to see a shuttle service to an overflow lot for Six Flags. PARTA would be the distributor to jobs etc. RTA now has a Park & Ride, and also provides service to Six Flags.
- The old station behind Six Flags is privately owned. It's on Brewster Road, and could become a new station.
- Short-term fixes are just band-aids. We like it that AMATS and ODOT are working together. We want a global, regional look at this. I told AMATS and ODOT that if their study ends up with only highway widenings, I will consider their study a failure.

LAKE EAST

- I'm in favor of commuter rail. It would be outstanding if you could get on a train and go from Lake County all the way to Lorain. Any time we can get our federal dollars back, I'm all for it.
- Are we willing to help pay for it? Yes, if we receive something out of it. We spend so much money making roads, we have to attend to rail service: we're so far behind.
- I'd love to have a stop here, and will be willing to work with you. We're developing a minor league baseball stadium here, to be completed in 2003, with 4,500 fixed seats and lawn seating, and with plenty of parking. This could be great: people would get excited about this. A stop at Rte 91 would serve Willoughby and Eastlake.
- Traffic is one of the problems all of us are facing, and of course you will run into the "NIMBY" problem anywhere in these rail corridors.
- I don't agree with [another interviewee] about people being unwilling to support commuter rail. Just because we care about the schools doesn't mean we don't work on other problems.

LAKE EAST

- We would want our own transit system to be a partner in a commuter rail system. If you needed $10 million in up-front capital, that's possible to raise. But it's harder if you're talking about $8 million to $10 million a year for continuing operations and maintenance. Are there signals from LakeTran that they would raise their allocation? ¼ of one percent sales tax might be possible.
- Painesville is progressive and proactive. There are several sites here that would be good for commuter rail. One is the Railroad Street site, the old RR station. There is space here for Park & Ride, and also as a community meeting facility.

There's a group that's been working on restoring this historic building. Neighborhood around the site is modest and somewhat deteriorated; train service here might bring some redevelopment in this area.

- In town is the Richmond Street site, approx. 4 acres are available (the asking price is $400,000 per acre): this is the old Walker Bros. Supply property at W. Prospect.
- Then there's the Lexington Avenue site south of the CSX line on the west side of the street. Forest City has 300 acres north of CSX for residential and commercial development.
- As for getting funding, [Congressman] LaTourette is very tight with rail people, so he's someone important to implementation.

[Points below are from a group session with three mayors, one County official]

- People are going to have lots of questions: What is the starting and ending point? Where would stops be along the line? What type of schedule would you have? Do you look at economic impacts? What is the mechanism for organization?
- Commuter rail is an excellent idea. It would be better if there were no local match.
- The Ashtabula Mall owners [Cafaro] may be interested in building a station with their malls.
- How much of your feasibility study deals with connections? That's going to be important – that people can get off the train and get to their destinations easily.
- This is a great idea, but money is an issue. I believe people in Ashtabula would use it.
- It will take a while for it to grow on people. Getting them on trains to Browns/Indians game is the key: that will make them use it for the first time, then they may use it for work. We have a surplus of employees in this county. There are a lot of laborers, not many trained employees. We have managers who work in Ashtabula County and live in Shaker Heights because of the good schools. It would help recruitment of higher-skilled employees if they could get here on a train.
- We are developing out here, and are interested in long-term development for housing.
- In Ashtabula itself, people will be interested in the location of the station.

- In Geneva, we have 2000 houses now being planned. Most of our residents commute back to jobs west of Geneva.
- In the summer, the population of Ashtabula County grows. We don't want Rte 90 to add three or four lanes. We don't want our vineyards to be torn up for more highways. The County Commissioners are working closely with communities to undergird their interests as well as on the county level.
- People may complain about more trains, even if they're only a few cars long. But bypasses and resolution of safety problems may help.
- Assuming that we do come up with a local share – and we will be strapped to do it – what's the time frame for a pass/fail decision? Could we be left with a station that we've paid for, but no rail line?
- Couldn't this also improve our existing transportation system?
- The County can play a leadership role. We have very good relations with Lake County, and we need to begin developing the strategy for getting major support from State and Federal agencies. Columbus is going to be interested in capital dollars, but not funding for operations.
- Once we've gotten pretty secure information on how much money is needed, we must speak with a unified voice. We should start with [Congressman] LaTourette, the Federal Rail Administration, and [State Senator] Bob Gardner.

GENERAL [representative of Mayors & Managers organization]

- Felt no one will support rail until first priority – the schools -- is addressed.
- Until highways get entirely clogged, people won't support it. Commuter rail makes sense, but where will you get this kind of money?
- One of the problems is getting welfare people to work where the jobs are. Solon seems to be a major work site. The number one issue is getting workers to sites. The problem is that rail is so expensive.
- You won't get anything else passed for taxes until you fix the school thing. This is a hot item. I don't think we're going to have other things of substance.
- When do we stop studying and DO something? Ohio has missed the boat on commuter rail. One of the only states in the union with major large cities – hubs – that aren't connected. These should be connected with high-speed rail, and should connect to Amtrak. If you could go from here to Dayton for $2.00, they would use it. But for many people, their car is their second home. Getting them out of the car is a major problem.

- We need to think of ourselves as a tourist destination. You could repair track, build new tracks, and get new signals and stations. You could build the industry for visitors if you had high-speed rail connecting Cleveland, Columbus and Cincinnati. We need to think of ourselves as tourist destinations. People also need access to colleges. You could connect universities with major cities.
- You should try one corridor. Avoid Corridors #1 and #2: I don't know that will happen to Elyria and Lorain: they're dying. Corridors #7 and #2 are heavily-used freight lines. Maybe you should aim for a pilot project: Cleveland, Akron, Canton, Kent State. Maybe you could market this, make it exciting, tie it in people's minds with jobs and education for Ohioans.
- We have to find the most plausible way to get across the Cuyahoga River to make any of those western routes – Lorain, Elyria, Amherst – to work. A new bridge is needed, because Norfolk Southern is not going to let commuter rail get in the way.
- I think you need to start with "buildable segments" and put the other corridors into a mode where they preserve the rights-of-way for future use – maybe commuter rail, maybe other public uses.
- The Randall Secondary also needs resolution.
- We are "Employment Central," working with transit agencies and Port Authorities. One of our challenges is pickup and distribution: this is of particular interest in Portage and Geauga Counties, where reverse commutes could be important. Financing will be a major challenge. Cities are likely not to ante up much. The City of Cleveland is having difficulty finding $17 million for the Dual Hub project, and will probably follow past practice of deferring to other sources. For the next year and a half, politics will be at an impasse.
- How interconnected are the lines being studied in NeoRail? Whole-system connections are needed – for Amtrak, 2C and light rail.
- Through-lines are a plus (e.g. take the train from Lakewood to Six Flags).
- At this point, [Congressman] Kucinich is neutral on commuter rail.
- Of the two western lines, the northern route (Lorain) is better than the southern route (Elyria). You can get extra benefit, such as summer travel to Sandusky and Cedar Point: tourism is an additional plus. Putting commuter rail in the Elyria corridor won't stop cornfields from being developed.
- Park & Ride is not preferred unless there is a parking structure. In Lakewood, parking could be developed near Geiger's clothing store.
- I live in Lakewood and works in Solon, at Bardons & Oliver. Our company exists there because I-480 exists. Cleveland's traffic pattern is convenient. I start

work at 7:30 and it takes me 25-30 minutes to get there, going on 480 East. It's 4 lanes packed, going 65 mph between 7:15 a.m. and 7:25 a.m., and travel is smooth. But midday there's a phenomenal traffic: you should find out who these people are: sales reps? Trucks?

- There are different ways of looking at this: you can't expand I-480 more than it is, but at the same time, can the city remain competitive if you shut off road-building altogether?
- If you take the Hudson route (4D), parking should be in town, not outside.
- If you take the Kent route (4E), the station MUST be within easy walking distance from Kent State.
- Commuter rail in the Akron-Cleveland will help the region: this is a future megalopolis.
- Operations are important – you need to time trains for football games, etc.
- You should go first class with this: you need to be able to have trains where people can plug in their computers, get coffee, and feel comfortable.

February 2001

NEORail II

Northeast Ohio Commuter Rail Feasibility Study, Phase II

NOACA ◆ Northeast Ohio Areawide Coordinating Agency
AMATS ◆ Akron Metropolitan Area Transportation Study
SCATS ◆ Stark County Area Transportation Study

Route 1 – Lake West Corridor
Cleveland – Lorain

Why is this route considered an early-term project?

- Cost-effectiveness – Route 1 has moderate ridership potential but a low initial cost of implementation, making it one of the most cost-effective routes overall.

    Cost - $174 million to provide up to 6 round trips per day – is low relative to the other potential corridors.

    Ridership – 2,400 daily boardings – is in the “middle of the pack” compared with the other corridors.

    The combination of service on Routes 1 and 6, in the Lakewood-Lorain and Solon-Aurora corridors, offers higher ridership potential (up to 7,000 daily trips) at a lower capital cost (under $300 million) than any stand-alone route or combination of routes.

- Implementation – Route 1 to Lorain should be one of the easiest corridors to implement in terms of obtaining approval from Norfolk Southern (NS) for use of its right-of-way.

    Route 1 requires only 1 mile of shared track with NS (across the Cuyahoga River lift bridge). While NS is not normally supportive of commuter rail trains using their main tracks, the proposed inclusion in the Route 1 project of the Erie-Nickel Plate connection offers considerable operational and capacity benefits to NS, which should compensate for the impact of a small number of Lorain commuter trains using the lakefront lift bridge.

    NS has agreed to limit the number of freight trains using the former Nickel Plate line to Lorain, which means that ample capacity exists on this line for running commuter trains.

- Phasing – Phased implementation of service makes sense in this corridor.

    The initial service to Lorain limits the number of trains to those that can be accommodated on the existing lift bridge.

    When additional capacity across the Cuyahoga River is provided, service on this line can be increased, raising the potential daily ridership on the line to 3,600 boardings.

- Other factors –

    Route 1 is clearly the most cost-effective of the three routes heading west from Cleveland.

    Route 1, in combination with one or more routes to the east of Cleveland, offers the opportunity for convenient rail travel between the western and eastern suburbs.

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Route 2 –West Corridor
Cleveland – Elyria – Amherst

Why is this route considered a longer-term project?

- Cost-effectiveness – Route 2 has moderate ridership potential but a very high projected implementation cost, making it one of the least cost-effective routes.

  Cost - $400 to $560 million – is high relative to the other potential corridors, reflecting the need for additional rail capacity along the entire corridor, including across the Cuyahoga River.

  Ridership – 3,100 daily boardings – is comparable to most other NEORail corridors.

  The combination of service on Routes 1 and 6, in the Lakewood-Lorain and Solon-Aurora corridors, offers higher ridership potential (up to 7,000 daily trips) at a lower capital cost (under $300 million) than any stand-alone route or combination of routes.

- Implementation – Reaching agreement with Norfolk Southern (NS) for use of its right-of-way in this corridor is expected to be relatively difficult.

  Route 2 requires a negotiated agreement with NS for use of up to 30 miles of its heavily used Chicago main line. NS approval is unlikely without substantial capital investment in additional main tracks and a new bridge crossing of the Cuyahoga River in downtown Cleveland. By comparison, Route 1 (Cleveland-Lorain) requires only 1 mile of shared track with NS.

  The passenger track alignment and station location at Hopkins International Airport will be affected by the airport's development plans.

- Phasing – Phased implementation of service is unlikely in this corridor, given the projected high initial capital costs.

- It is recommended that all of the potential longer-term projects be monitored for changing conditions that could affect implementation.

What early term actions should be considered?

- Monitor and participate in the initiatives to provide intercity high-speed rail service to the Cleveland-Chicago and Cleveland-Columbus-Cincinnati corridors

  Opportunities for sharing high capital cost of required rail capacity improvements

  Potential broadening of constituent base in support of railroad-related investments

- Improved Transit Linkages

  Express bus service to Cleveland and major employment centers

  Express feeder bus to Tier I stations (e.g., Westlake, Avon) or to GCRTA Red Line

- Right-of-Way Preservation – for parallel main tracks alongside NS Chicago Line, potential train storage yard sites in Elyria and/or Amherst, and potential station sites

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Northeast Ohio Commuter Rail Feasibility Study, Phase II

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Route 3 – Southwest Corridor
Cleveland – Medina

Why is this route considered a longer-term project?

- Cost-effectiveness – Route 3 has a relatively low cost-effectiveness rating, compared to the other NEORail corridors.

    Cost - $390 million – is high relative to most other potential corridors, reflecting the need to construct an expensive track connection between the NS and CSX lines in the vicinity of Hopkins Airport and the need for additional rail capacity across the Cuyahoga River.

    Ridership – 2,500 daily boardings – is low compared with the other NEORail corridors, since the rail line does not run through the densely populated areas of Medina County.

- Implementation –

    Route 3 requires negotiated agreements with three different freight railroads for access to their rail corridors – Norfolk Southern, CSX and the Wheeling and Lake Erie Railroad.

    Completion of the required capital projects on this route is expected to be a difficult and time-consuming process. Private property acquisition and extensive environmental impact analysis will be required to create a new commuter rail right-of-way linking the NS and CSX lines in the vicinity of Brook Park and/or Berea.

- Phasing – Phased implementation of service in this corridor does not make sense, given the very high initial cost of required track connections.
- It is recommended that all of the potential longer-term projects be monitored for changing conditions that could affect implementation.

What early term actions should be considered?

- Monitor and participate in the initiatives to provide intercity high-speed rail service to the Cleveland-Chicago and Cleveland-Columbus-Cincinnati corridors

    Opportunities for sharing high capital cost of required rail capacity improvements

    Potential broadening of constituent base in support of railroad-related investments

- Improved Transit Linkages

    Express bus service in I-71 corridor to Cleveland and major employment centers

- Right-of-Way Preservation – for preferred right(s)-of-way for future NS-CSX rail connection, where additional main, passing or connecting tracks will be needed along the NS, CSX and W&LE lines, and at potential station and storage yard sites.

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NOACA ◆ Northeast Ohio Areawide Coordinating Agency
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Route 4 – South Corridor
Canton / Akron / Cleveland (CAC) via Hudson

Why is this route considered a mid-term project?

- Cost-effectiveness – Route 4 is competitive with other corridors but requires high initial investment

  Cost - $450 million – high relative to other corridors.

  Ridership – 5,600 daily boardings – also high relative to other corridors, but requires frequent bi-directional service to Cleveland, Akron and intermediate points, which is expensive to provide.

  The combination of service on Routes 1 and 6, in the Lakewood-Lorain and Solon-Aurora corridors, offers higher ridership potential (6,600 daily trips) at a lower capital cost (under $300 million) than either of the CAC routes (Routes 4 or 5)

- Implementation – Ease or difficulty of reaching agreement with freight railroads

  Route 4 requires negotiated agreements with Norfolk Southern for access to the rail corridor between Cleveland and Hudson, and with CSX for crossing or accessing its right-of-way in Akron; neither of these railroads is supportive of commuter rail, unless considerable investment is made to permit passenger and freight trains to operate largely independent of one another.

  The Route 1 & 6 combination entails fewer miles of shared right-of-way with busy freight lines and requires dealing with only one freight railroad (7 miles on NS, versus 26 miles on NS and CSX for Route 4), which should enable agreement with NS to be reached more easily and quickly than in other corridors.

- Phasing – Partial or phased implementation of service in the South Corridor results in relatively low ridership for the dollars expended (i.e., low cost-effectiveness), so the most cost-effective approach is to implement service in the entire corridor.

- Service in the South Corridor is a logical mid-term extension of early service on the Solon-Aurora line, because it uses the same tracks for the first 6 miles south of Cleveland, thereby reducing the incremental cost of implementation.

Why is this route preferred over Route 5 via Kent?

- The choice between the two CAC alternatives was difficult, due to the similarity of cost and ridership.

- However, assuming early implementation of commuter rail service in the Solon-Aurora corridor, adding the route from Cleveland to Akron via Hudson would result in less market duplication than adding the route via Kent. The Hudson alignment, therefore, was recommended for inclusion in the mid-term set of projects.

February 2001

NEORail II

Northeast Ohio Commuter Rail
Feasibility Study, Phase II

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Route 5 – South Corridor
Canton / Akron / Cleveland via Kent

Why is this route considered a longer-term project?

- Cost-effectiveness – competitive with other corridors but requires high initial investment

    Cost - $440 million – high relative to other corridors.

    Ridership – 5,100 daily boardings – also high relative to other corridors, but requires frequent bi-directional service to Cleveland, Akron and intermediate points, which is expensive to provide.

- Implementation - W&LE willing to negotiate track use, but agreement with NS (a less willing partner) is still required
- Phasing – Partial or phased implementation of service in this corridor results in relatively low ridership for the dollars expended (i.e., low cost-effectiveness)
- Major Factor – In recommending mid-term, there was a presumption that the early-term projects were already in operation. The choice between the two CAC alternatives was difficult, due to the similarity of cost and operational characteristics. However, the CAC Hudson alignment would result in less market duplication than the Kent alignment and, therefore, was recommended for inclusion in the mid-term set of projects
- It is recommended that all of the potential longer-term projects be monitored for changing conditions that could affect implementation.

What early term actions should be considered?

- Improved Transit Linkages

    Express bus service to Cleveland, Akron and major employment centers

    Express feeder bus to Tier I stations (e.g., Aurora)

- Right-of-Way Preservation

    Wheeling & Lake Erie mainline

    Right-of-way for parallel tracks alongside NS Cleveland Line

    Branch lines owned or being acquired by Akron Metro

    Potential station sites

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NE0Rail II

Northeast Ohio Commuter Rail Feasibility Study, Phase II

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Route 6 – Southeast Corridor
Cleveland-Solon-Aurora-Mantua

Why is this route considered a potential early-term project?

- Cost-effectiveness – Route 6 overall is estimated to be the most cost-effective of the seven potential routes, in terms of passengers carried per dollar of required capital investment

  Cost - $190 million – low relative to other corridors.

  Ridership – 4,000 daily boardings – high relative to most other corridors:
  highest in the region when measured in terms of passengers per mile of railroad (this route is 30 miles long, compared with over 60 miles for the South Corridor).

- Implementation – Of the seven NEORail corridors, Route 6 to Solon and Aurora is the one that should be easiest implement, in terms of obtaining approval from Norfolk Southern for the operation of commuter trains over their right-of-way.

  The first six miles out from Cleveland follow the busy double-track Cleveland-Pittsburgh main line, where a third track for passenger trains is assumed to be built. With this track in place, addition of commuter trains will have no impact on Norfolk Southern main line operations.

  The remaining 20 miles of this route follow the NS Randall Secondary, which is now a minor branch line with infrequent freight service. Commuter trains can be operated over this route with no significant impact on freight operations, and NS is likely to support commuter trains on this line, which could help the profitability of this line for NS.

- Phasing – Installation of 6 miles of third main track on the NS line southeastward from Cleveland is a prerequisite for significant commuter rail service. With this improvement in place, plus passing sidings at appropriate locations on the Randall Secondary, it will be possible to operate early-on a high level of service on this line with relatively low incremental costs.

- Other factors –

  Major employers located along this line have expressed interest in rail service as a means for transporting employees from Cleveland who do may not have access to automobiles for their journey to work. They have indicated a willingness to provide connecting van or bus service.

  Two amusement parks which are major regional tourist attractions – Six Flags and Sea World – are situated within convenient walking distance from the rail line. Rail offers an opportunity to carry significant numbers of employees and visitors to these sites, helping to limit parking demand and relieve traffic congestion in the SR 43 corridor.

February 2001

NEORail II

Northeast Ohio Commuter Rail Feasibility Study, Phase II

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Route 7 – Lake East Corridor
Cleveland – Painesville – Ashtabula – Conneaut

Why is this route considered a mid-term project?

- Cost-effectiveness – Route 7 ranks third among the seven NEORail corridors in terms of cost-effectiveness, after the two recommended early-term corridors (1 and 6).

  Cost - $250 million – low relative to most other corridors, and of the same magnitude as each of the two recommended early term corridors

  Ridership – 3,300 daily boardings – "middle of the pack" relative to other corridors, with significant up-side potential if the relatively attractiveness of downtown Cleveland as a destination for work trips originating in Lake County remains strong.

  The recommended early-term combination of service on Routes 1 and 6, in the Lakewood-Lorain and Solon-Aurora corridors, offers the potential for approximately double the ridership (approximately 7,000) at a capital cost that is only 20 percent higher ($300 million) than Route 7.

- Implementation – Ease or difficulty of reaching agreement with freight railroad owners

  Route 7 requires negotiated agreement with CSX Transportation for access to the rail corridor east of downtown Cleveland; CSX is not likely to support commuter rail, unless considerable investment is made to permit passenger and freight trains to operate largely independently.

  The recommended shorter-term combination of routes 1 & 6 entails fewer miles of shared right-of-way with busy freight lines (7 miles on NS, versus 67 miles on CSX for Route 7 to Conneaut), which may enable agreement with NS to be reached more easily and quickly than with CSX.

- Phasing – Partial or phased implementation of service in the Lake East Corridor results (e.g., to Mentor or Painesville) would be feasible and potentially cost-effective.

- Because this route connects directly with the proposed downtown Cleveland station site, implementation of commuter rail service in this corridor can proceed largely independently of the development of service in other corridors.

Why is a lower level of service recommended east of Painesville?

- Based upon projected 2025 demographic and regional travel patterns, potential commuter rail ridership is low east of Painesville. Provision of full commuter rail service would require construction of additional track capacity, which is not justifiable given the low projected ridership. However, should Ashtabula County wish to support and pursue commuter rail service to Cleveland, there is precedent elsewhere in the U.S. for limited, rush-hour commuter service on relatively busy two-track freight railroads.

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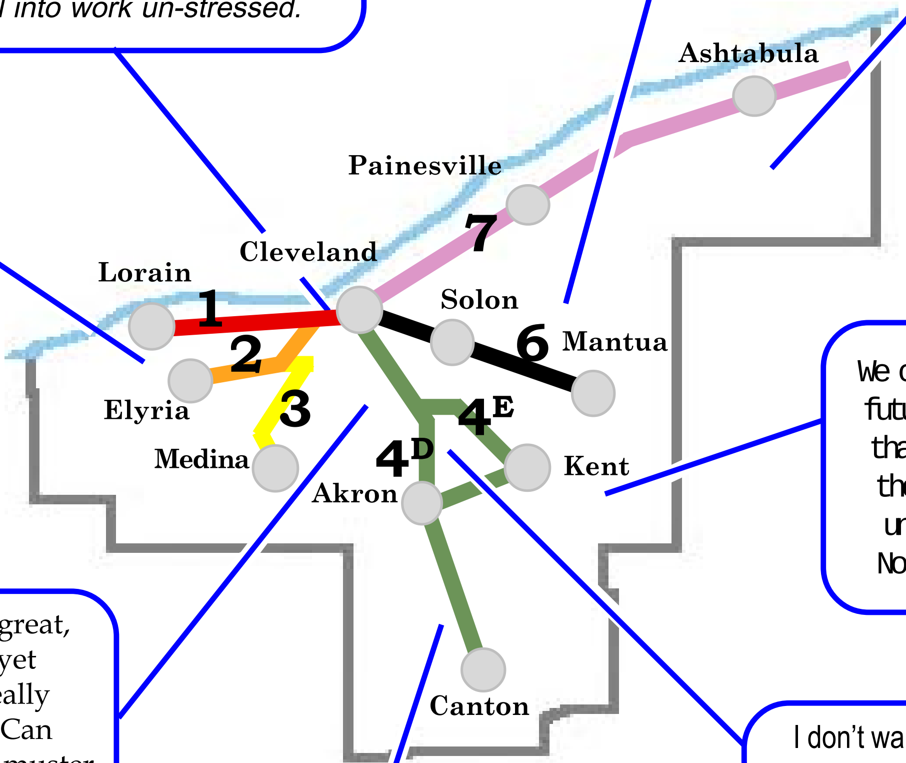


I live in Lakewood, and work in Solon. If I hit the road at 7 a.m., I can drive to work easily. But if I'm 15 or 20 minutes off, I'll be very late. I 'd love to ride a train, drink coffee, read the paper and stroll into work un-stressed.

The traffic from Six Flags is killing us.

We want to encourage people to build along the commuter rail line in Ashtabula County so the vineyards farther south won't be threatened by development.

We're already preparing for commuter rail. A train station is part of our downtown revitalization strategy.

We can envision a future rail service that connects all the colleges and universities in Northeast Ohio.

This all sounds great, but we haven't yet answered the really hard question: Can Northeast Ohio muster the regional cooperation needed to pay for the system and maintain it?

I hope it happens. I think a lot of people would want to take the train to Indians games.

I don't want a train in my back yard, period.

Potential Commuter Rail Lines Get Close Scrutiny in 'NEORail II'

The issues above, along with many others, are now being addressed by local transportation planners as part of the "NEORail" study scheduled for completion in the Spring of 2001. NEORail -- short for Northeast Ohio Commuter Rail Feasibility Study-- began in 1998 with an assessment of 38 individual rail alignments, in 10 potential commuter rail corridors in nine Northeast Ohio counties.

That Phase I analysis narrowed the list to seven feasible corridors that merited further investigation: those are the routes shown in the map above. NEORail Phase II is now underway, and is scheduled for completion in the Spring of 2001. Preliminary recommendations for phased implementation have been developed, and are being offered for public review and comment.

Ranking the Options: How Do the Corridors Compare?

The star chart below shows how the corridors were ranked when the project's Commuter Rail Advisory Committee used evaluation criteria and regional development goals to rate individual routes. Two other critical factors will be measured as the study continues: the likelihood of railroad cooperation (needed for sharing tracks or rights-of-way), and the strength of local political and financial support (being tested in meetings with local stakeholders and the general public). Below, corridor ratings are relative. Ridership and cost figures are rounded. The star chart has five levels: low(one star), low-medium (two stars)), medium (three), medium-high (four), and high (five).

★ = LOW ★★★★★ = HIGH

Corridor: Assumed terminus:	1 Lake West (Lorain)	2 West (Amherst)	3 SouthWest (Medina)	4^D South (via Hudson)	4^E South (via Kent)	6 East (Aurora)	7 Lake East (Conneaut)
Ridership **Total Daily Boardings**	3,620	3,070	2,540	5,600	5,120	4,020	3,260
Capital Costs: Assumed at highest Level of Service (LOS 3) except (Painesville-ConneautLOS 2)	$260 million	$560m	$390m	$450m	$440m	$190m	$250m
Operations & Maintenance:	Medium Cost	Medium Cost	Medium Cost	Med-High Cost	Med-High Cost	Medium Cost	Med-High Cost
Cost Effectiveness Rating:	★★★★★	★	★	★★★	★★★	★★★★★	★★★
REGIONAL GOALS							
Promote Concentrated Development:	★★★★	★★★	★	★★★★	★★★★	★★★★★	★★★
Provide Transportation Choices:	★★	★★★	★★★	★★★	★★★	★★★	★★
Support Urban Core Areas:	★★★★	★★★	★★★	★★★★	★★★★	★★★	★★★
Expand Access to Jobs:	★★	★★★★	★★	★★★★	★★★★	★★★★★	★★★
Enhance the Environment:	★★★★	★★	★★	★★★★	★★★★	★★★★	★★★
Use Existing Infrastructure:	★★★	★★	★★	★★★	★★★	★★★	★★
Leverage Federal Financial Support:	★★★★★	★★★★	★★	★★★	★★★	★★★★★	★★★★

When Are 1 + 1 Not 2?

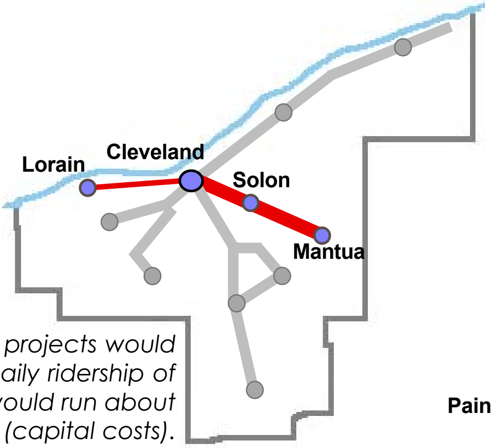
The comparison above shows that Corridor 1 costs about $260 million to build, and Corridor 6 about $190 million: a total of $450 million. If both lines were implemented at the same time, however, savings could be achieved by using the same rail yard, cars and downtown terminal, and by adjusting Levels of Service (see next page, bottom). Such a combination package is shown on the next page as "Early Projects" in the phased implementation plan. By combining the corridors for shared equipment and shared costs, and by providing a Level of Service 2 rather than LOS 3 on the Lorain line, adequate service can be provided on both lines for about $300 million.

Early, Mid- and Longer-Term Projects Outlined in Phasing Plan

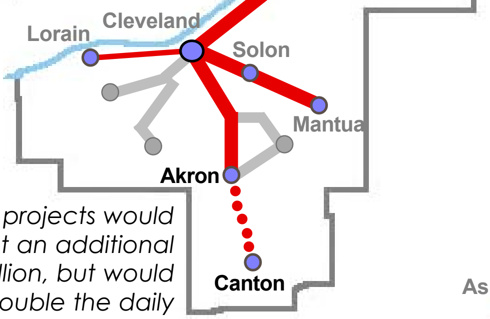
Planning for commuter rail in Northeast Ohio passed an important milestone in mid-January 2001, when the advisory committee overseeing the NEORail study met to draw up a plan for the phased implementation of a region-wide commuter rail system. Under the proposal, commuter rail service would begin in two corridors: a a western line between Lorain and downtown Cleveland, and an eastern route from Cleveland to Mantua. In these and the other five corridors, the project's Commuter Rail Advisory Committee placed high priority on protecting rail rights-of-way for future public use.

A second, "mid-term" round of projects radiating out from Cleveland would enlarge the system's reach south to Hudson and Akron (with extended service to Canton), and eastward to Painesville (with extended, but less frequent, service farther east into Ashtabula County to serve Ashtabula and Conneaut).

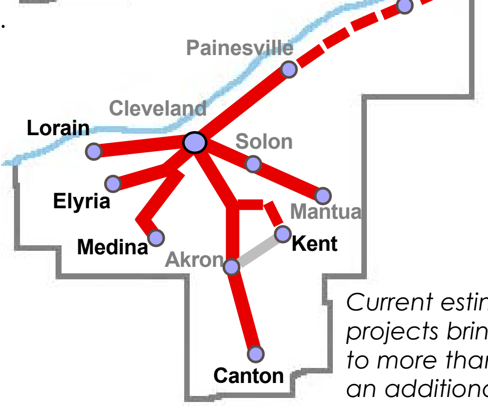
Additional projects, now assumed to be longer-term, could bring rail service west to Elyria and Amherst, southeast to Kent, southwest to Medina, improve regional public transit access to Hopkins Airport, and provide upgraded service to Canton and Lorain. Changed conditions, local support, and growing demand could move these projects up the implementation ladder.



Early projects would attract daily ridership of 7,000 and would run about $296 million (capital costs).



Mid-term projects would cost an additional $547 million, but would double the daily ridership to 14,000.



Current estimates show longer-term projects bringing daily ridership up to more than 16,000, but costing an additional $757 million. The full, cumulative cost of early-, mid- and longer-term projects is $1.6 billion.

● Where's Your Stop?

If early projects were built, a train could start in Lorain and run the full length of the system, stopping at Sheffield, Avon, Westlake/Bay Village, Rocky River, Lakewood, a new North Coast Transit Center (near North Coast Harbor), E. 55th/Euclid, E. 88th/Union, E. 131st/Miles, North Randall/Bedford Heights, Harper Rd., Solon, Geauga Lake, Bainbridge, Aurora and Mantua.

Phasing Plan Calls for Varied Levels of Service

In the mini-maps on this page, different line-types correspond to different Levels of Service (LOS) on the commuter rail system. The higher the LOS, the more train trips would be provided on the line. The three levels are described in detail below. Levels of Service were set based on the number of riders that the line is expected to carry, or on the number of trains that could operate on the line each day wihtout additional costly rail improvements. "Peak hours" are morning and evening rush hours, with "peak direction" meaning toward Cleveland in the morning, away from Cleveland at night.

Level of Service 1 • • • •

Minimum service, no reverse-peak
3 daily round trips (6 daily trains); peak hours, peak direction service only;
45 minute peak headway. **

Level of Service 2 —

Basic service, limited reverse-peak
6 daily round trips (12 daily trains); 4 trains in peak direction in peak period; 1 reverse peak train in peak period; 35-40 minute peak headway; 1 midday round trip

Level of Service 3 ▬

Basic service w/ full reverse-peak
11-12 daily round trips (22-24 trains); 5-6 trains in peak direction in peak period; 3-4 reverse peak trains in peak period; 30-35 minute peak headway; off-peak service every other hour

** Headway is the time between trains

NOACA • 1299 Superior Ave
Cleveland OH 44114

NEORail II

Study sponsored by NOACA (Northeast Ohio Areawide Coordinating Agency), AMATS (Akron Metropolitan Transportation Study), & SCATS (Stark County Area Transportation Study).

Questions? Call NOACA, 216-241-2414, ext. 352, or the study's public involvement office, 216-371-3323.

What is Commuter Rail?

- Usually diesel-powered passenger trains of three to five cars plus locomotive
- Capable of operating on existing railroad tracks (NEORail trains would use existing tracks or new track in existing railroad right-of-way)
- Serves longer-distance trips with fewer stops than light rail (in the Cleveland area, light rail runs on RTA's Waterfront Line, Shaker/Green Line and Van Aken/Blue Line)
- As a transit alternative, generally more expensive than buses and less expensive than light rail

NEORail Study Ends in Spring 2001, Implementation Still Years Away

The NEORail Phase II study will be completed in the spring of 2001. At that time the Commuter Rail Advisory Committee will develop recommendations on whether, when, and how the region should pursue a commuter rail system.

The Committee will send its recommendations to the boards of the "Metropolitan Planning Organizations" that are charged with transportation planning in the region: NOACA (Northeast Ohio Areawide Coordinating Agency) serving Cuyahoga, Geauga, Lake, Lorain and Medina Counties; AMATS (Akron Metropolitan Area Transportation Study) serving Summit and Portage Counties; and SCATS (Stark County Area Transportation Study). Ashtabula County is also included in the study.

Through their own decision-making processes involving affected county and municipal governments, the boards of the MPOs will determine whether to move a recommended commuter rail plan on to the next stage of study. Five or six more years of planning, engineering, negotiating and fund-raising might be required to implement the commuter rail system's early projects.

NEORail II Northeast Ohio Commuter Rail Feasibility Study - Phase II

Report on Public Meetings February 2001 - Summary

As part of the public outreach effort for the nine-county Northeast Ohio Commuter Rail Feasibility Study, Phase II, nine community meetings were held in February 2001. These meetings were designed to evoke public comment concerning the preliminary recommendations for phased implementation of commuter rail service in seven potential corridors.

Meetings sites, chosen so that persons from all corridors would have a convenient place to attend, were in Bay Village, Lorain, Medina, Hudson, Canton, Twinsburg, Kent, Aurora and Mentor. (The choice to hold a meeting in Twinsburg as well as in Kent, Hudson and Aurora met an earlier commitment to the mayor of Twinsburg to hold a meeting there.)

Sign-up sheets show total attendance at 364, though the actual number of attendees was slightly higher (e.g. a head count in the Lorain meeting showed 82 persons in attendance, but fewer than 70 signed in). Twinsburg and Hudson came in at a comparatively distant second and third with 58 and 56 persons attending respectively. The lightest attendance, 12 persons, was at the Medina meeting.

At each meeting, a series of 18 display boards was set up and attendees were invited to spend the first part of the meeting perusing them. An introduction by NOACA staff (in eight of the nine meetings, project manager Steve Jones; in the Bay Village meeting, Executive Director Howard Maier) was followed by a brief presentation (usually 20 minutes) by consulting team members Foster Nichols and/or Don Emerson). Most of the meeting was reserved for attendees' questions and comments, which were recorded, paraphrased, by consulting team member Genevieve Ray. People were also invited to submit written comments, and many did.

Recurring themes, main points heard and recommendations for possible further planning study topics fell into these general categories:

- Financing/Funding: initial implementation financing; operating and maintenance costs; local taxes.
- Operations: possible system ownership/management, fares, running times, station locations, distribution and connections.
- Impacts
    - Safety: children, emergency vehicle access, at-grade crossings, increased use of current low-use tracks
    - Environment: (both negative and positive effects were perceived)
    - Property values (both negative and positive impacts were anticipated)
- Implementation Phasing: proposed tier organization of phase-in plans,
- Political and Decision-Making Process: who decides, what might role of citizens be, opportunities for local ballots or other direct involvement in final decisions.

General Findings

The overall tone of the meetings reflected a community interest in the accomplishment of a regional commuter rail transportation system in Northeast Ohio. Responding to the information provided regarding the feasible plans for routes and implementation as a result of the previous studies, citizens' concerns, questions and comments, while consistent with previous reports, were more concentrated regarding details of operations and impact. Opposition to rail plans were once again expressed and upon study of meeting notes it should be recognized that such opposition was generally site specific. It should also be noted that the written comments from certain meetings sometimes overruled those more vocal in opposition.

Emerging Themes

1. Many questions and comments were posed regarding the finance framework of implementing a regional rail system. Would the financing be federal, state, or local? The issue as to whether federal transportation grants that were applicable to this project has been investigated was raised. Would the citizens in a locality be able to vote on this issue at the ballot? Cost/benefits issues were raised, especially in comparison to other transportation modes, i.e.: highway expansion, bus service.

Once in place, funding for operation was also a concern. As with previous public outreach meetings these questions revealed an informed public in that there was a knowledge of other cities/regions and the rail operations ability to 'pay for itself'. Would operations be covered by the 'farebox'? Would it require subsidies and if so for how long? Would taxes be required to support continued operation? A figure for annual operating and maintenance costs were frequently requested.

2. Details regarding operation were often the subject of questions and remarks. These inquiries reflected both an inherent notion that a rail system was rightfully 'in the pipeline' as well as those questioning some of the figures used to determine routes and ridership to justify implementation. Fares, who would operate the system, the tiering of phases, station locations, especially the terminus location in downtown Cleveland, and connections and distributions at stations were repeated concerns

3. The impact of commuter rail, both positive and negative, was brought forth at each meeting. From a positive standpoint the possibility of future development along each corridor, a reduction in highway commuter traffic and a reduction in air and noise pollution were all cited as incentives for backing the plan. Negative impact questions and remarks were more recurrent, especially in Corridors 4 and 6, the Silver Lake homeowners with numerous concerns and objections. These concerns were in regard to safety (at-grade crossings, low level use tracks now shifting to high level use, i.e. children unaccustomed to train traffic and emergency vehicle access), negative environmental impact, noise pollution, and an adverse effect on property values. Requests for no-build scenarios were submitted.

4. Questions and comments regarding the political and planning processes that surround this project were advanced. The sentiment that citizens might be left out of the decision

making process were apparent, both from advocates in regards to an implementation standpoint to those wanting to know how they could “pull the plug on this”.

Recommendations for Further Planning Studies

In view of stakeholder issues presented from the public meetings, further studies should provide information regarding specific operations plans, and environmental and local impact in order to assist in assuring positive citizen participation and support.

Corridor 1 - Lorain / Corridor 2 - Elyria

Meeting Held in Bay Village, February 8, 2001, with 36 in attendance. General Tone: Positive, supportive. Highlights: Congressman pro-transit, wants conformance with rail limit agreements and public process; interest in details: fares, running times, funding, connections, distribution and time frame for implementation. Concerns regarding safety measures.

An opening statement was presented by Martin Gelf and, a representative of Congressman Dennis Kucinich, 10th Congressional District, covering these points

- Background information on the $87 million agreement with Norfolk-Southern to insure safety measures and to limit the number of trains. Currently 24 trains/day, will be 13.9 trains/day)
- Emphasis that the Congressman supports commuter rail and transit but will support whatever people here want. He noted that Lakewood, Rocky River, and Bay Village Mayors as well as Congressman Kucinich are signatories to that agreement. Said that any NEORail decisions must occur with these parties and the public.
- [in response to an attendee’s comments on LTV steel]: LTV is in trouble because of illegal imports; Congressman Kucinich and others are addressing this problem.
- [in response to a resident’s question]: “Will Kucinich really support this if people here support it?” The Congressman feels it is a good idea to have transportation choices.

Finances/Funding:

- Funding operating costs - obviously not covered by farebox.
- Who funded this study?
- Lines 1 through 6 costs - fares
- Now the railroads are having trouble making money, fitting Amtrak trains into the heavy freight schedule

Operations: Summary: comments and questions relate on the whole to specific track use and hours of operation; connections, stops, station locations, schedules and efficiency of rail.

- Lines 1 & 6 - what input or communication have you had with RTA? Why not light rail?
- Would there be light rail during the day and freight at night?
- Line 1 used to have two tracks, so did Line 6. They took the rails out quietly, this shouldn’t be allowed to happen again.

- Could you get a train to Lorain & go to Mantua? Would it make stops at Six Flags, etc.? Are you considering this?
- What would be the travel time from Lorain to Downtown Cleveland?
- This will require good connections in outlying areas.
- Your schedule calls for 21 minutes from Bay Village to downtown - people would not be able to drive that fast.
- There should be a stop at Crocker and Bassett (south of Detroit needs a stop at Crocker Park).
- Route 6 brings you to East 55th & the Cleveland Clinic. This is a strong point of that corridor.
- Commuter rail is inherently efficient. You can seat 160 passengers in a car; you need only 2.5 horsepower per passenger; you can use fuels other than petroleum. European and Eastern U.S. systems have high midday traffic. Counter flow service should be provided.
- Riders can get a lot done if the train has computer hookup.
- The auto is not freedom, but confinement. This is not a gridlock city. What factors support you ridership figures?
- Written: Please send me a schedule QUICK!!!
- Written: Alternative power source trains? (Solar) How many each car each seat?
- Written: 1) Run through potential is excellent. 2) Definitely need to be flexible to get Six Flags, Cedar Point, Browns, Indians games. 3) Bike carriers needed. 4) Portable laptop hookups.

Impact:

- What safety measures and horn limitations would be in place?
- The Inner Belt construction would be a good time to get people to use transit. I'd prefer light rail to diesel. I have two grown children who only know how to get to places in a car. With environmental problems, global warming, etc. we need to make other choices. I support this and like it.
- We care about the safety of children, and the efficiency of emergency vehicles. We worked hard to cut down on the number of trains, and need to balance this with the frequency needed for a good commuter rail system.

Implementation:

- Time frame for implementation?
- This needs to be compatible with the Convention Center
- Will extra track have to be added?
- How is this study tied in with the Inner Belt?
- Line 1 - What positive comments have you heard? Who will get out of their cars? This is not a big city.
- My comment is about the lift bridge [over the Cuyahoga]: maybe we won't have to worry with LTV going down the toilet.
- Another project that could help is reopening the Cuyahoga River channel.

Political Works/Processes:

- All of us will have to bite the bullet for this to happen.
- Do we know President Bush's feelings on transit?

- You talk about the “Region deciding” on whether to do commuter rail: would this come to a vote?
- Written: Question/Comments: Excellent visual aids - have more meetings to show them off! Bring RTA along next time. Will there be any additional bus routes created to get riders to the commuter rail stations? Presentation very informative - keep us posted.
- This is the first time I’ve heard Cleveland talk about something progressive. If it keeps being put off 10 more years, etc.
- You should add Avon Lake to your brochures.
- Written: Are copies of the Phase II study available to the public?
- Written: Yes! Yes! Yes! It’d be nice to know when comments for finite details are taken on construction for these routes. The concept is good, it’s practical. Can it be “fast tracked”?

Corridor 1 - Lorain / Corridor 2 - Elyria
Meeting held in Lorain, February 15, 2001, with 82 in attendance. General tone: enthusiastic support, viewed as an asset to Lorain County. Highlights: interest in operations details though questions 19th century technology reliance; recognition that it will require “lots of political work” to make it a reality.

Financing/Funding:
- Who would fund it?
- What would the annual subsidy need to be?
- You’re buying the equipment?

Operations:
- Would the Elyria line duplicate RTA red line? Or are you connecting to RTA?
- What’s the fare?
- Where would trains stop in Cleveland? Where would it start in Lorain? The Grove site?
- Who would operate it?
- Are you looking at electric or monorail trains? Are we giving money to Europe for their trains?
- You have right-of-way: why not come up with different vehicles? Like a hovercraft? Why use 18th-19th century technology? They aren’t working hard enough for the 21st and 22nd centuries. We’re talking about the future of moving people.
- I agree - Cleveland had the first stop light, why not better technology?
- Can you do a loop to help people get to work in Elyria?
- Have you talked to CSX and Norfolk Southern about being contractor/operator? There are lots of issues; e.g.: unions, that need to be addressed.
- The railroads would have a win-win situation if they operated the commuter service. They could also add mail service.
- Would cars go all the way to Mantua or just Cleveland?
- Where else are diesel trains working?
- South of the railroad tracks are 24 acres where railroad cars could be stored.

Impact:

- If and when the commuter rail is established, how many jobs in Lorain would be generated?
- Are there communities where economic impacts of commuter rail can be seen?
- We live in Charleston Village & really got excited about this – Lorain has Lake Rd. - 35 mph, 2 lanes all the way to Cleveland. We have to do this! Our lighthouse will be an attraction, if you had corridor connecting amusement parks. I want to read from this book on Lorain's history, because it has meaning for today: "the Charleston neighborhood had been asleep. The railroad was the spark that set the town on the road to growth."
- What happens to the depot if this doesn't go through

Implementation:

- How do you rate these corridors? There's not much to go to in Mantua unless you're a farmer.
- How much actual track construction would be needed on Line 1?
- What is the best case timeline?
- I'd like to connect Wellington to Lorain on rebuilt railroad line.
- Written: Make Lorain #1 priority.
- Written: There are as many as 50,000 Lorain Countians living in Lorain Co. driving to Cuyahoga Co. to work every day. A visual inspection of vehicles on any given day driving to & from Lorain/Cuyahoga would indicate single occupant vehicle & therefore a need for 45,000 vehicles per day plugging the roads, contributing to smog & consuming a non-renewable resource (fuel). Rail traffic is prime now for Lorain County & the region. Act now. Please.

Political Works/Processes:

- What more can Lorain do to stay in the forefront?
- In 1933 I rode the train to Cleveland. When I was [Lorain] mayor in the 1980's I said why not rail to Lorain? Instead we had another lane to I-90, which was later blocked off. Now it's a zoo. Cleveland is afraid of "out-migration". Every time we bring up something else we're fighting Cleveland. Why don't we get a break? It's our money. The train should go all the way to Cedar Point. We want a slice of the pie.
- I'm excited - It will benefit everybody. We need to get people behind this. There's a lot of political work that needs to be done. Matelsky, Armbruster, and Manning are in place now [Ohio Senator Jeff Armbruster, committee chair, Senate Transportation Committee; Rep. Jeff Manning, co.-chair, House Transportation Committee; Rep. G. Daniel Matelsky, ranking Democrat, House Transportation & Finance committee]
- Written: This is a great asset for Lorain County & the City of Lorain. This is a natural for a Transportation hub (rail, bus, bike, cars & pedestrian) all in a traditional downtown. This site will also connect nicely with the Lorain County Historic Rail line from Southern Lorain County in Wellington. I could ride a train from Wellington to Cleveland, see a game or go the Rock & Roll, etc. and not have to fight for parking or anyone else.

Corridor 3 - Medina

Meeting held in Medina, February 20, 2001, with 12 in attendance. General tone: vague acceptance. Highlights: funding comparisons to highways; broad questions regarding operations and implementation.

Financing/Funding:

- Might - would - be cheaper than highway beltway.
- The Aurora line should be done first. Why is it $190 million?
- Who will get funding for this?
- The 4.3% federal diesel tax goes back into highways, but rail doesn't go back into rail. There's a big question of whether trucks/highway pay their way.
- Highway people just keep the dollars in their pockets to build a few bridges and fix some potholes. People should know that highways are borrowing too.

Operations:

- The Downtown Cleveland station should be Tower City. Superior and St. Clair are developing; Tower City owners shouldn't be the final say. Keep freight at lakefront and passengers up the hill. You could also connect to University Circle, which is a second "downtown". Tower City is more at the heart of the population.
- The Aurora line should be done first. That whole end of the county has no public transportation. There's very little freight operating on the Aurora Line. Let freight operate at night

Impact:

- Haven't cities like Toronto and Chicago encouraged development along rail lines? We're gobbling up land in what I call the "Sublurbs".
- Have you studied what rail transport will be in 10 years? Do the railroads know?
- Household expenses are now ranked as #1 = housing, #2 = transportation and #3 = food. People should know about studies like the one showing Californians spending 12% of their disposable income on transportation, while New Yorkers spend only 6 percent.

Implementation:

- Medina should be part of a southern [rail] beltway that goes from Akron to Kent
- Is there merit in looking at the I-71 corridor? You could connect with Rapid and maybe also to Columbus/Cincinnati.
- What's the time for implementation: 3 to 5 years?

Political Works/Processes:

- The Ohio population isn't increasing quickly, but it will increase and like Europe we will need transit developed.
- Won't you need political and business leaders on the local level?
- Where's the Gazette [newspaper]? They should be covering this.

Corridor 4 - Canton/Akron/Cleveland via Hudson

Meeting held in Hudson, February 6, 2001, with 56 in attendance. General tone: fearful and opposing with only marginal support. Highlights: Skepticism on ridership projections; fear from Silver Lake and Crystal Lake residents regarding many issues: safety, freight, noise, pollution, impact on wildlife and a plummet in property values. An expressed apprehension that this would be forced upon them without any public input. Proponents less vocal but cite environmental benefits and links to urban centers.

Financing/Funding:

- Is there a real market for commuter rail?
- Will it pay for itself?
- What would be the sources of funding?
- I don’t think the benefits justify such a massive plan.
- Why isn't (a decision for) more highways also a cost?
- Your estimates of total daily boardings of 6000 only equals 2000 + people; this is less than 1/2 of 1% of the Summit County population. You haven't discussed operating costs; would the ¼% sales tax have to be doubled? What would be the cost of a ride from Akron to Cleveland? All of us would have to pay, and I wouldn't ride this. I see no public good in this.
- I haven't heard a good reason for this. I've heard the figure $450 million, and that the service won't pay for itself: all this just for 2,220 people to ride?
- Written: 1) If this expenditure is paid for by the public, why isn't the public asked up front if they are willing to pay for it? 2) When will the financing question be addressed?

Operations:

- To make this work does freight have to be carried?
- How many people could ride on one train?
- My neighbor told me, “I wouldn’t ride because of connections at the Cleveland end”.
- Would this be a faster ride to Cleveland?
- In our real lives the issue goes to freight. The Port Authority has the freight rights. We’ve thought of putting the freight rights in escrow, but this will not happen under the current leadership of Norfolk Southern.
- The line would be 3 tracks to Hudson. Near Barlow it’s only one track.
- Freight trains probably won't come through. I've been interested in trains all my life. How would trains be dispatched?
- How will Cleveland support this system? i.e.: RTA lines? Bus service? Taxi cabs?
- When you were talking about commuter direction, you did not refer to Cleveland-to-Akron. Why? What is the expectation of numbers and reasons for people coming to Akron?
- Written: Hopefully it will happen soon and with lots of trains and a full schedule!
- Written: Will this train haul freight? How about garbage?

Impact: Summary: The strongest opposition to rail was expressed at this meeting most notably in respect to the negative impact passenger rail would have on the Silver Lake development. The issues raised were ones of safety (children, emergency vehicles), environmental impact on wildlife (blue Herons) and the lack of information provided regarding any studies that had been done on these issues. A fear of a sharp decline in property values was vocalized as well as the concern about traffic congestion and delays at rail crossings. In contrast, there were comments regarding the *positive* impact this would have on the area.

Negative:

- Why would Ohioans give up their love for going to the Indians games in their cars?
- This reminds me of Silver Lake's experience with sound barriers: we kept being told, "Don't worry." This commuter rail would affect us. Small communities like Silver Lake can't take this like big cities can. How many other cities have houses this close to the tracks?
- I'm concerned over the impacts in Silver Lake between Graham and Route 59. If both are shut off, the impacts would be tremendous.
- You have to study impacts on the area and the neighbors.
- I live in Silver Lake, and I'm happy about no trains. In your study, you haven't concerned yourselves with people, small children, and the value of homes that will depreciate if commuter trains run. They're terrible tracks, and improving them for commuter rail would probably attract freight.
- I have three concerns for Silver Lake & Crystal Lake. One is child safety, another is whether sound walls will bounce noise back to houses, and the third is the blue heron and other wild life that are in the area. Does someone look at these issues?
- What are your assumptions on property values? Would they go up, go down or stay the same?
- Your information shows three phases. Do the proposals get assessed for other things, like impacts on the environment? Have there been any environmental impact studied?
- Proximity to a residential area: is this a fatal flaw? It seems to me that things like wetlands are looked at, and property values aren't. You're talking about spending 1.6 billion to serve a few riders. Will someone look at: economic impacts on real estate values? You have narrowed this to just a few assumptions. This should have happened first, as an initial screening consideration.
- When tracks are brought up to standards, it will be better for freight. Will the environmental analysis include freight?
- When Continental buys Delta & moves out of Cleveland, Hopkins airport will be one giant freight terminal.
- Written: Why do I feel that we are about to be hit by a runaway train and we can't do anything about it!
- Written: There are 3000 people in Silver Lake who will be negatively affected by this idea and only 2,800 potential beneficiaries.
- Written: This whole idea sucks!
- Written: How will one station in Akron help grow the potential "urban development" of Akron?
- Written: Property values, safety & quality of life in Silver Lake Village must be a part of any planning study. Silver Lake Village: x 'Land' Value = $100K,

Peak Land Value = $400K [This will be the point of] a probable class action law suit.

- Written: Property values in Silver Lake Village would plummet. I am a licensed title agent and close house sales for a living. I have access to the figures. This issue was treated disrespectfully tonight. You are sorely mistaken. 2) It is simply just too expensive for the highly questionable benefit. 3) Residents in Silver Lake were here first. There have been no trains my entire adult life in my neighborhood. That's why we bought it in 1983. Keep trains out. 4) The noise pollution would be significant as well as the horns at Front St. and Graham Road. Peace and quiet would be gone. Silver Lake already has to deal with the noise from the completion of Route 8, and the sound wall which didn't work.
- Written: Our concern is for the wildlife that nest on the close Silver Lake.
- Written: There are a lot of kids that play in our neighborhood which is next to the tracks. We are concerned for their safety. [Silver Lake].
- Written: For Silver Lake and Cuyahoga Falls the traffic hold up at Bailey, Hudson Rd. and Route 59 would be terrible.
- Written: I think it would be necessary to call in the EPA to access the impact of the trains noise and vibration on the habitat of the blue herons that live on Silver Lake (1/4 mile from track)
- Written: The EPA should be called in to assess the effects on the Blue Heron & other wildlife on Silver Lake which is next to the tracks.
- Written: Our house sits next to the tracks and the kids play out back. Safety is an issue.
- Written: Many homes close to the tracks in Silver Lake; very concerned for children’s safety?
- Written: The track through Silver Lake has been inactive for 20 years. Local children have never known trains here. The middle school pedestrian bridge goes right over the tracks. The train would be dangerous to our children.
- Written: This sort of ridership projection is unprecedented. Computer models do not take into account sociological factors. People do not want to leave their cars. Ask them, in a true circumstance, not just a "wouldn't it be nice" question. This is not Chicago, NY or London. The sacrifice at the local level does not warrant the "estimated" (your word) benefit.
- Written: The safety focus issue is critical. When freight trains run through Silver Lake again, they will block Front St. (59), Hudson Drive & Graham at the same time. Ambulances cannot get to the Akron hospital. That is unacceptable. It is foolish and naive to say that if commuter rail runs, freight won't follow.
- Written: The line through Silver Lake runs between Silver & Crystal Lake. Many shore & songbirds live in the area & would be adversely affected. I am a biologist who has drafted many EIS's for Sec 208 facilities plans. Please look into this.
- Written: It would tie up RT. 59, Bailey Rd., Hudson Dr. and Graham Rd. Bad traffic congestion. Hospital emergencies?
- Written: Concerned about the safety factor for Silver Lake kids playing by the tracks.
- Written: We are totally opposed to running trains on this track. Can't believe you'd let it go through except for money!

Positive:

- We should be asking, what are the impacts 10, 15, 20 years if we don't do it? We'll have more cars, more pollution, more highways. Somebody now may be gored, but I'm thinking of the future.
- I have a passenger line in my front yard, and I work near Broadway. I just am sorry that this won't happen soon so I could use it.
- These freeways aren't always going to be here. When you start adding people in Macedonia (5,000 more within 10 years), etc., you've got to think of the future – growth of 5000 in Twinsburg, 10,000 in Streetsboro, 10,000 in Stow. All of that open space will be houses. The traffic on I-271 and I-480 has at least doubled every 5 years. Driving won't be nice.
- Anything to make people get to places more efficiently without getting in to a car and clogging up major highways. I'm all for railroad passenger service.

Implementation:

- Are there plans to reduce at-grade crossings?
- Would the old train station be put back into service?
- Buses are available now - could more buses be added?
- Maybe we should buy more buses?
- Was the Cuyahoga Valley Line considered?
- In the "Best case" scenario, how long might it be before trains go down this track?
- Written: Is NE Ohio a guinea pig? Has any other metropolitan area implemented a commuter rail transportation system within the last 25 years? If there has, what has the result been? I am concerned that after building it, it will be rejected and abandoned.

Political Works/Processes:

- Where does decision making occur: local governments with planning agencies?
- What is NOACA? What is its relationship with local government?
- Who would be the lead agency? Implementation would require great sacrifice (economic, social) for neighbors. A risk-benefit analysis should be done.
- Will we be able to vote on this?
- Who can stop this from happening?
- If the MPOs say yes, can anybody stop this?
- I'd be interested in straw poll [results: 8-yes, 3-making up minds, 27-no]
- Who can pull the plug on this?
- Written: An obvious option to rail commuter trains is the ease of bus travel. Why spend a lot of time and dollars to develop a detailed commuter rail system plan when a quick analysis may show that bus travel is the best alternative. The goal is to move people in the most cost effective manner - not how do you build a rail commuter system.
- Written: Results of the straw poll: For 8 (18%), Neutral 9 (20%), No 27 (62%), Total 44 (100%)

- Written: It looks like you also need to budget some $ for public education, to open some minds. We in the suburbs benefit from the big cities, and could only benefit more by being more efficiently connected to them.
- Written: Bravo! We need regional, pro-active planning for the future like this. The plan looks good to me.

Corridor 4 - Cleveland/Akron/Canton

Meeting held in Twinsburg, February 7, 2001, with 58 in attendance. General tone: mixed opinions though generally opposing. Highlights: Opponents (Twinsburg and Solon) cite a variety of safety problems, cost/benefit, costs, maintenance and lowering of property values; proponents (Twinsburg, Bedford and Solon) point out benefits regarding traffic congestion (Six Flags, Rte 43), pollution, and anticipate higher property values.

Financing/Funding:

- What would be annual operating costs? Would you need taxes to support fares?
- Federal government - Will they give most of the money needed for this?
- I'm a Solon resident concerned about operating expenses. Now you're talking $8 million. This is higher than I recall from previous meetings. We need both-way traffic. We don't have a good count of how many suburban people will give up the safety & convenience of their cars. We should have opportunity to identify whether people will ride.
- Twinsburg is 100% against this project. How much are we spending per person? You could take them to work in a chauffeur-driven limo for this money.
- What's your margin of error?
- Local financial commitment: How local?
- The BART system spends $400 million for operations & Maintenance. $190 million comes from the fare box; $210 million comes from sales tax/prop tax.
- Why subsidize transit for people who have chosen to live in the suburbs? They won't take public transportation.

Operations:

- I don't agree that suburbanites won't use the train. They can talk on cell phones and use their laptops in the train.
- Huntington Woods Neighborhood Association (15-20 houses): We see both sides of the issue, but we have questions:
    - Extending the line to Mantua – this is a different business model. Do you have ridership projections? What is the incremental cost for Phase 1, Solon to Mantua?
    - How will the widening of Route 43 to five lanes affect the Solon-to-Mantua ridership projections?
    - Who will take ownership of safety issues?
    - Will federal dollars spur Solon-Mantua use? I think money was just okayed for an upgrade of the Solon-to-Mantua tracks, just for two customers. Who will coordinate use?

        - Without answers to these questions, I guarantee a fight with Huntington Woods.

- I favor regional rail development. Existing rails determine where service would go. Where would it go in downtown Cleveland.
- Where did this start? A Geauga Lake exit ramp off 422 could resolve this problem. You could connect to the Blue Line out Shaker at I-271. You aren't addressing I-90 East and I-90 West, I-480 into I-77; I-77 around Brecksville, etc.
- For the line out to Mentor, won't there be competition with LakeTran?
- Westlake is being serviced by RTA.
- Rails now going at low speeds – will these trains move at 60 mph?
- The line from Solon to Mantua will be used by freight at 35 mph. They have to blow their whistles 6 times at crossings. It this true for commuter rail? Would they be crossing Liberty & Pettibone Roads at 60-80 mph?

Impacts:

Positive:

- I am from Solon and I speak for residents in favor of commuter rail (44 statement signatures). We are concerned about congestion associated with Route 43 and Six Flags and the shopping mall, and heavy traffic to Cleveland. Commuter rail will improve property values and quality of life.
- Have your ridership projections included more recent & proposed developments?
- This would help the environment. I favor trains in Solon.

Negative:

- I'm concerned about what will happen to property values along track.
- I moved here from Bedford, and don't want to see more trains in Twinsburg.
- Privacy and safety are big concerns. I don't want subsidized trains in Solon. We need more highway widenings.
- I'm a Twinsburg resident. Our community is bisected by I-480; the western section is isolated; and Routes 82 & 91 also impacted us. I worked at the Chrysler plant and on the way to work one day I sat at a railroad crossing, waiting for a 107-car train. STAY OUT OF TOWN! [see full written comments in next section]
- We have a problem with commuter rail in Twinsburg. We have some site-specific problems. I don't want the need for local subsidies to cut into other services we provide. How will 5,000 to 7,000 riders affect congestion?
- We already have interstate traffic; a rail station would bring even more traffic.
- There are two crossings through my ward in Twinsburg. We've had numerous problems with the W&LE with poor maintenance, broken equipment, and repeated calls that got no response. I don't want to go through this again.
- If the same target customers aren't using buses, why would rail attract them?

WRITTEN COMMENT RE: PROPOSED RAIL SERVICE IN TWINSBURG CITY:

> There is no other city in these United State that has done more for transportation than this City of Twinsburg. We have allowed our City to be bisected diagonally through its center to accommodate an Interstate Highway System, viz., I-480. This System not only bisected our City area, leaving the entire western section completely separated from the mainstream of all local activities, schools, churches, fire and rescue services, police department, library, stores and recreational facilities, but it also planted two major interchanges in the city center to accommodate two State Routes, 82 & 91.
>
> The existing, single, railroad track, which is a remnant of the horse and buggy days, also bisects every main and secondary artery of the entire city. Three years ago, on my way to work at Chrysler which is a scant two miles from my home, a train passed through at 7:15 am that tied up mot only my street, Cannon Rd., but also Herrick Rd. S.R. 82, S.R. 91, and Glenwood Dr., creating an absolute gridlock while 107 cars idly passed by. I know there were 107 cars because I was first in line and counted them.
>
> We do not need any additional traffic adjuncts in the City of Twinsburg. We have already done more than enough to accommodate the traffic generated by our adjacent neighboring communities' recreational facilities. We do not need any additional rail commuter traffic to add to the jams we are already experiencing that will jeopardize, to any further degree, the availability and accessibility of our fire and rescue services.
>
> Signed [Twinsburg resident]

Implementation:

- I’m a Councilman in Bedford. The Norfolk Southern track carries 48-50 trains a day, Wheeling line only carries 6 trains a day. I've worked with RTA - They can't afford themselves anymore. Buses don't work well enough so they need to put in rail or commuter train. Surprised that Routes 4, 7, and 5 aren't shown as Early Projects. I favor moving Route 5 up in priority list. For financing, you should look at license plate fees, a parking tax and regional cooperation agreements.
- Bedford is in favor of putting a station in. This area is growing so fast, we’ve got to do trains.

Political works/Processes:

- You said this would go to the MPOs. There will be no vote for money from Twinsburg.
- There are good points on both sides - will all comments be considered through the remainder of the study?

Corridors 4 and 5 - Cleveland/Akron/Canton/Kent

Meeting held in Canton, February 7, 2001, with 21 in attendance. General tone: as a whole supportive. Highlights: opinions and questions regarding operations (trackage, fares); positive impact regarding fuel consumption, pollution and endless parking lots.

Financing/Funding:

- Maintenance costs are higher for electric.
- Your trip in a car is also subsidized.
- You show costs of $450 million. That equals $80,000/rider - you could buy all those people a car. Getting 5600 people off the roads is a benefit, but not that much of a benefit.
- Other projects around the country have far exceeded their initial projections.

Operations:

- The route through Hudson is better than the one through Kent. There are lots of people here who commute.
- Are you going into Alliance? You'd have to use former Norfolk Southern line since access to the NS mainline is very difficult. I had experience with the 2-C, where it couldn't be done.
- Doesn't the scenic line plan to use that line?
- How much line did METRO buy?
- Diesel or electric trains?
- Cuyahoga Valley line will expand from Harvard to Cleveland and South to Zoar, Mineral City to Dover, 11-13 miles. Access to New Philadelphia, lots of commuters going north from Tuscarawas. (red).
- Route 4 is a 2-hour commute - what type of fare is assumed?
- I just took the trip from Joliett into LaSalle Station. The fare was $9
- The Tuscarawas County Commissioners are interested in getting a port authority to purchase the east-west panhandle line. It would go Columbus to the West Virginia panhandle, Pittsburgh to Columbus.

Impact:

- We must compare doing this plan to doing the alternative. We can't keep building parking lots where traffic doesn't flow, we can't keep increasing pollution.
- We should think about fuel consumption: we must conserve. This is not going to get better.

Implementation:

- What is the time frame for mid-term projects?
- Mantua to Aurora - Isn't this track abandoned?
- Would double track be needed for Mantua line?
- Re midterm projects: what's a fly-over bridge? Please explain.
- Am I right that a mid-term project might become early project?

Political works/processes:

- Construction to Canton will be hell over the next 10 years. We would be glad to work with you to extend service south.

- Why not do a demonstration project to fast track this (e.g. use Amtrak station)?
- Did you do commuter surveys as part of your ridership projections?

Corridor 5 - Canton/Akron/Cleveland via Kent

Meeting held in Kent, February 5, 2001, with 42 in attendance. General tone: overall supportive

Highlights: comparisons drawn between transit and highway funding and subsidies; questions regarding operations details: routes, connections, stations; economic impacts in Mantua/Six Flags link from east; peculiar that corridors 4 and 5 aren't first.

Financing/Funding:

- Potential funding sources: Have you identified these?
- What is the real operating cost of the system? If it's $7, what is the local share $14? How would it be raised?
- How does this compare to what we pay in subsidizing highways? Please include this idea in your report.
- Ohioans should remember our tax dollars have built the Northeast corridor. It would be good to have federal dollars in Ohio for a better quality of life.
- Why is the CAC so expensive? Could it be built incrementally?
- What income can be generated by selling "ad space" as on buses?
- Written: I am very anxious for this study to be able to compare the true taxpayer costs of subsidizing highway construction. Northeast Ohio transportation funds provide for no alternate transportation system, beside the automobile routes. When we realize the future will depend on wise energy consumption, we should realize subsidizing alternative transportation pathways are cost effective compared to highway expansion exclusively.

Operations:

- Your ridership figures: are these one-way (to Cleveland) or both?
- What about students riding to school at Kent State? Was this considered?
- NOACA van pools - how have they worked? Was this information included in the model?
- Your proposal is heavily oriented toward Canton-Akron-Cleveland, but inter-city travel is rare. The model should look at suburb to city. Line 6 is a no-brainer. Also Kent is another obvious market . Your model is missing this potential.
- Was a Kent-Youngstown link considered?
- What is the cost to ride the route from Mantua to Cleveland?
- Do you know what the running times would be.
- The east line will be attractive to people going to Six Flags. Mantua is getting more traffic now than it used to. People could park in Mantua & ride to Sea World.
- Will trains really be as palatial as is shown on the back of the newsletter?
- There should be an automated system, moving people quickly, to minimize standing time.
- Stations - what will they be like? Big stations at the ends, with only platforms at stations in between
- Will there be connections to the airport & RTA?

- The ridership estimate - was this based on now or when it would be built?
- Written: Would there be handicapped-accessible cars? Bathrooms?
- Written: Would there be special trains to the Wooly Bear Festival? 4th of July at Blossom? Rock
- Written: Groups? School tours?
- Written: Fed Ex Air has their white/orange; Fed Ex ground has their white/green; UPS has their brown - so, what color design is proposed so the NEORail becomes a rolling advertisement?
- Written: Are any food bars considered? or bring you own food & drink on board while you ride?
- Written: Put draft schedules on web site so all can see what it could look like.
- Written: Great plan! Could you use a lighter weight diesel engine than the one depicted on the back of the brochure? Would this save $?
- Written: Think about a Kent-Akron shuttle service using a type of rail diesel car.
- Written: How will the Kent connection to Akron connect with Hudson?
- Written: Plan a rail system to Ravenna ordinance area. Develop industrial park. This could be a rapid transit system for the county.
- Written: Cost is important but ridership is key!
- Why not build or remodel train cars so that people can take courses, work out, transport bicycles, have somebody (H&R Block) do your taxes, or do other transactions on board

Impact:

- I went to Minnesota, to the Mall of America, and saw an example of "If you build, will they ride": Business is already growing up along this line. (Kiosks for coffee, etc.)
- Local people need to be involved in discussion of impacts.
- Option #6 - Will this tend to exacerbate urban sprawl?

Implementation:

- You show the Cleveland-Akron-Canton line as a mid-term project. Akron would bring more riders than Painesville. Why not put Akron in the early-projects category?
- Would these be single or double tracks?
- Route 6 – is this single track mostly? It’s now single or none, and used to be double track. That would be a good line for some other use, like a bike-hike trail.
- Do the early projects include any grade separations?
- What are the next steps?
- It seems like it would make sense to build first where most riders. It's peculiar that lines 4 and 5 aren't first, in the “early projects.”
- Written: If LTV Steel goes bankrupt how would you use the rail lines into/through that area (Cleveland)?
- Written: We need to get the Mantua-Cleveland up and running ASAP. This should have been done years ago.

- The project should proceed from plan to practice with dispatch - for the general welfare of citizens generally!

Political Works/Processes:

- You should let people know about “Buy America” policies.

Corridor 6 - Solon/Mantua

Meeting held in Aurora, February 22, 2001, with 34 in attendance. General tone: overall supportive

Highlights: concerns regarding local funding and taxes and the ability for residents to vote on subsidizing this project; questions extension to Mantua both from a purpose and an operation standpoint; extended hours to parallel those of Six Flags; acceptance higher with newer technology.

Financing/Funding:

- Local" funding - is this really local (i.e. municipality)? It should be county. A tax? Would this be subject to a vote?
- What would the federal funding be?

Operations:

- You couldn't pay for parking in downtown Cleveland for the fare you mentioned. This seems like a bargain.
- How involved are the RTA's?
- When Six Flags is open, would the operating hours be longer?
- An occasional rider - might they pay as much as $10? e.g. in the Mantua portion of the line? Would a Six Flags employee really pay $10/day to come/go to work?
- Park & Ride could also come into this - people might park in Mantua and ride from there.
- Where in Mantua would it go?
- Chamberlin Rd. is where tracks now stop - does the business here intend to fix the tracks - would there be freight movement late night (e.g. 3 am, 5 am)?
- Who would operate the system? When would the trains start running?
- Electro-magnetic trains: were these considered? There might be greater acceptance if newer technology were used.
- Commuter rail is benefit in the regions that are served. Many employers offer passes to employees. This is good, and requires no out-of-pocket expense.
- How about diesel, self-propelled trains? (no engine) Dallas-Ft. Worth & Tri-Rail contract out the actual operations. Toronto almost breaks even.
- All modes of transportation are subsidized. Trains can use a variety of fuels.
- Do you know about plans to run freight service on this (Solon) line?
- The NYC Subway gives seniors 1/2 price tickets. $8.50 for one week, unlimited

Impact:

- Regarding the commuter rail to Mantua: now there is a lot of housing there, which people are likely to see as a noisy nuisance.

- Written: It would seem to me that the benefit of this project would be in establishing all corridors to benefit travel throughout the Cleveland area.
- Written: I think the residents of the areas impacted would not be willing to pay this tax for the initial capital required or to support the future operation of the line in the event that ridership is not sufficient to cover the daily operation. In addition, I will not support this project for this reason and the train tracks that are being recommended on the Solon route run through my back yard...will affect my property values and my $400,000 house is 1 year old.
- Written: I live on Mantua and grew up going to the station to meet my aunt. I would love to see this come back. As far as the noise from a train – bring it on! Have you ever listened to a sand pit at 7 am on a Sunday morning? I think the train would be a welcome sound.

Implementation:
- What is the time frame?
- There's a privately-owned (old) station at Geauga Lake. What if the owner doesn't want to have it used for trains again? Does this defeat the plan?
- Written: The Lorain, Cleveland, Solon, and Mantua line sounds great. We really need this in right now. This was a commuter rail for over 100 years and should be back in service.

Political works/processes:

- What is the process from here on?
- A tax? Would this be subject to a vote?

Corridor 7 - Painesville/Ashtabula

Meeting held in Mentor, February 21, 2001, with 23 in attendance. General tone: overall supportive Highlights: Ashtabula County resolution supports rail proposal; inter-modalism, lots of parking important; connect to RTA blue and green lines; discouraged that we're tier 2, wants more analysis before decision; consider non-passenger revenue sources (mail, UPS).

Financing:

- A regional rail authority: is this assured? What are estimated O&M costs
- Have you considered such non-passenger revenue sources as off-hour mail or UPS items to the airport? UPS is right next to my house. They send things to airport every night.

Operations:

- Did you consider reverse ridership out to the jobs in the suburbs?
- Do you know how many people are going to Hopkins from Lake County?
- Reverse commute is important re: airport. I see people toting suitcases at Tower City who are looking for hotels. So people are also "reverse commuting" for other purposes (other than work trips).
- Connections are really important - getting to actual destination, Have you studied this?

- Inter-modalism is important. So is having sufficient parking. Dallas is a good model to look at.
- Would seasonal traffic west be part of this service?
- A regional rail authority: is this assured? What are estimated O&M costs?
- Access to stations: you said this is important, but your plans don't show RTA's Blue or Green lines, or connect to the Red line so you can avoid the problems at Collinwood yard?

Impact:

- Have you looked at the "no build" option - what would happen if you did not build this?
- Sprawl advocates see this as unnecessary: everyone should have cars.
- We think that future riders, high-density housing, and commercial/industrial development around stations could affect your figures.
- I represent the women who spend at least 4 hours/week driving their husbands to the airport.
- To what extent are "NIMBY" concerns being addressed?
- Look at Louisville as a model: whistle-free zones should be explored. Safety gates and other, newer technology should be examined.
- Written: Not everyone who wants to go places can drive -- the young and older people, for instance. In 2001, the baby boomers start turning 65.

Implementation:

- Written: Excellent presentation of proposals. Excellent answers to questions asked. Good discussion. Excellent project. Hope to ride commuter rail soon.
- Written: Do you realize it only takes four feet of land for a pedestal to elevate a train?

Political Works/Processes:

- How do you project ridership? (esp. where there has been no service for years?) Not a lot of places are like us (Chicago has railroad in place, and a sympathy for rail.)
- It appears that CSX is the fly in the ointment. Would it make sense to offer CSX a partnership (to move Route 7 up to a higher priority?
- What happens if your projections for Routes 1 & 6 were wrong, overestimated? Does the whole thing fall flat?
- Why is ridership so high in Route 6?
- Who is on the Commuter Rail Advisory Committee?
- Who is "the region" that is going to decide? and when?
- It's hard to keep coming to all these meetings. How can I affect this process?
- Written: Wish your website(s) included all of this. It hasn't been updated for this round of meetings.
- Written: See also “Resolution Number 2001-215 supporting the efforts of NOACA, AMATS and SCATS to establish commuter rail service to Northeast Ohio” from the Ashtabula County Commissioners (1-1/2 page rolled up in the note paper).

Appendix: Meeting Attendance by Residency

Meeting at Mentor, 21 Feb 2001

Mentor (6)
Painesville (3)
Concord (2)
Euclid (biz)
Kent (biz)
Penna Township
POBox44077
Cleveland 103
Randolph
Rock Creek
S. Euclid (2)
Wickliffe
Willoughby Hills (2)
Willowick

Meeting at Aurora, 22 Feb 2001

Solon (8)
Aurora (6)
Mentor (6)
Painesville (3)
Kent (2)
Reminderville (2)
44202
44255
Akron
Chagrin Valley Times
Chardon
Cleveland 106
Cuyahoga Falls
Garrettsville
Madison
Parma
Randolph

Meeting at Lorain, 15 Feb 2001

Lorain (43)
Elyria (8)
Amherst (2)
Avon Lake
Columbus
Medina
Oberlin
Olmsted Falls
Wakeman
Wellington
zip 44053

Meeting at Medina, 20 Feb 01

Medina (5)
Akron (2)
Elyria (2)
Bevinsville
Sharon Center

Meeting at Bay Village, 8 Feb 2001

Lakewood (8)
Bay Village (6)
Westlake (4)
Avon/Avon Lake (3)
Rocky River (3)
Tremont (2)
44102
44116
44140
44140
BV=44140
Farmer
N. Olmsted
North Ridgeville
Olmsted Township
Pic=44126
Velve
zip 44129

Meeting at Kent, 5 Feb 2001

Kent (23)
Akron (4)
Stow (4)
Niles (3)
Cuyahoga Falls (2)
Ravenna (2)
Hiram
Mantua
Mogadore
ODOT

Meeting at Hudson 6 Feb 2001

Silver Lake (23)
Hudson (19)
Stow (9)
Akron (2)
Garfield Hts
Mayfield Hts
Peninsula

Meeting at Canton 7 Feb 2001

Canton (7)
Alliance (2)
Dover (2)
"The Repository"

Akron
Clinton
Dennison
Columbus
Dublin
Green
N. Canton
RPC??
Uniontown

Meeting at Twinsburg 7 Feb 2001

Twinsburg (32)
Solon (19)
Bedford (3)
Bedford
Beachwood
Cuyahoga Falls
Northfield
Reminderville
Stow
Streetsboro

Lorain meeting: Can I get a good quality color image of the North Coast transportation hub used in the 13th panel at your display? I could use it in my publication, the Ohio Passenger Rail News. Also of the hypothetical timetable for Rtes 1 & 6. Thanx, Mark Carlson, 479 Humiston Dr., Bay Village, OH 44140, 440-356-1112, mdcarlson@core.com

Appendix C:
Alternative Solutions

1. **Alternative Solutions Report**
2. **Study Area Employment Exhibits**
3. **Study Area Population Exhibits**
4. **MWRRI and 3C Corridor Map**
5. **Rail Improvement Studies Map and Cleveland Enlargement Map**

APPENDIX C - ALTERNATIVE SOLUTIONS

Introduction

The NEORail study has focused on assessing the feasibility of commuter rail as a viable transportation option for the Cleveland area. The study has compared the large number of potential rail corridors in the region to one another and against regional and national thresholds for viability, and developed a prioritization and phasing strategy that provides the best opportunity for a commuter rail network to be developed in the region.

However, in order to secure the Federal funding that would be necessary to develop commuter rail service in the region, commuter rail must be compared with other alternatives that address regional and corridor-specific transportation deficiencies, and be selected as a preferred alternative. The next step in the Federally-prescribed planning process would be a Major Investment Study (MIS) or Alternatives Analysis (AA) to evaluate the relative costs, benefits and impacts of mode and general location options.

This memorandum will discuss, in general terms, a variety of transportation options in each of the NEORail commuter rail corridors included in the near-term and mid-term recommendations -- Corridor 1 (Lake West/I-90), Corridor 6 (Solon-Aurora-Mantua) and Corridor 7 (Lake East/I-90). Corridors 4 and 5, the Canton-Akron-Cleveland corridors, are the subject of an on-going MIS, will not be considered here. Corridors 2 (Elyria) and 3 (Medina) are in the NEORail II third tier, or long-term, and, presumably, will not be developed for a number of years. Issues in those corridors will be considered best closer to the time of their development. Transportation issues in those corridors and throughout the region will be impacted by the operation of commuter rail in several other corridors, and the transportation issues should be considered in light of the pre-existence of commuter rail. Finally, the travel markets served by Corridor 2 (Elyria) substantially overlap with those served by Corridor 1 (Lakewood-Lorain), and therefore many of the issues applicable to Corridor 1 are the same as those that would be identified for Corridor 2.

Current and Future Transportation Problems and Opportunities in the Corridors

The major trends that are potentially impacting transportation policy in the Cleveland region over the coming decades present differing and often conflicting points of view:

Trends that could make efficient development of new public transportation services difficult:

- population and employment that is growing very slowly but dispersing rapidly;

- Downtown Cleveland, while still the region's largest employment concentration, is projected to diminish in its relative importance as an employment center over the next 25 years.
- suburban development patterns that are scattered, self-contained and of low density
- increasing numbers of suburb-to-suburb and reverse commute trips that are difficult to serve with public transit.

Trends that potentially favor future investment in new regional public transportation:

- an aging population that will require and demand public transportation in some form, most likely at levels above what exists today
- increasing recognition of the environmental and social consequences of dependency on the private auto
- increasing awareness of the effect of transportation convenience and connectivity on the region's economic vitality and ability to achieve economic growth.
- increasing scarcity of fossil fuel, with growing uncertainty as to sources and stability of price.

Population

Trends projected by NOACA generally show a dispersion of population and employment, the continuation of a process of suburbanization that began more than 50 years ago. Unless steps are taken to reverse, these trends, particularly the increasing suburbanization of employment, as well as the growth in employment participation, will continue to show dispersion which could point to increased auto use and possible decrease in transit effectiveness. .

Table 1, below, shows the population in 1990 and a population projection for 2025 for the five counties in the NOACA region. The regional population is expected to increase by 60,000 persons over this 35 year period, an increase over the period of less than 3% and a rate of annual increase of less than 0.1%. However, this small change in population, effectively a projection of no regional growth over a 35-year period, masks anticipated migration within the region—continued dispersion of population from Cleveland and Cuyahoga County to the surrounding counties. As the table shows, Cuyahoga County is projected to lose more than 90,000 persons over the 35 year period, while all of the surrounding counties in the NOACA region (as well as the bordering counties of Portage and Summit in the AMATS region, information for which is not shown) are posting population increases. As a result, Cuyahoga County's proportion of the region's population drops over the period from more than two thirds to 61%. The least developed counties in the region—Medina and Geauga—are those projected to have the highest rates of population growth over the 35-year period. Given the low-density development pattern characteristic of current, auto-oriented residential development, this dispersion of the population presents the region with conditions that makes operation of public transportation—whether bus or rail—more difficult.

Another population trend likely to have a significant impact on transportation in the region is the shift in growth from east side to west side suburbs. For many years, outward migration in the Cleveland area has been more pronounced on the east side than on the west side, but NOACA projections indicate that population growth will shift significantly to the west side suburbs over the next 25 years. Lorain and Medina Counties are projected to grow by 118,000 people by 2025, while Lake and Geauga are projected to grow by only 22,000. Almost 85 percent of the residential growth in the NOACA region, therefore, is projected to occur to the west and southwest of Cleveland. Thus, the center of gravity of population in the region is forecast to move westward.

Table 1: Change in NOACA Region Population by County, 1990 to 2025

	1990		2025		Change	
County	**Total**	**Percent**	**Total**	**Percent**	**Total**	**Percent**
Lorain	265,163	12.8%	319,143	15.0%	53,980	20.4%
Cuyahoga	1,387,937	67.1%	1,297,427	61.0%	-90,510	-6.5%
Lake	213,309	10.3%	223,741	10.5%	10,432	4.9%
Geauga	80,285	3.9%	102,155	4.8%	21,870	27.2%
Medina	121,073	5.9%	185,320	8.7%	64,247	53.1%
Total	2,067,767	100.0%	2,127,786	100.0%	60,019	2.9%

Employment

The projected loss of more than 100,000 jobs in Cuyahoga County over the 35 year period is even more pronounced than its loss of population. While Cuyahoga County will remain the region's greatest concentration of employment, the county's proportion of the NOACA region's total employment will decline from just over three-fourths to less than two-thirds. These projected losses are more than made up by anticipated employment gains in surrounding counties. Two less-developed counties, Geauga and Medina, will gain the most proportionally, with employment more than doubling in Geauga and nearly doubling in Medina. Lake County is projected to gain the most, in raw numbers, with more than 66,000 additional jobs in that county over the 35-year period. Continued employment dispersion could result in fewer dense employment nodes that are attractive as a public transit destinations.

The population growth west of the Cuyahoga River is not matched by employment growth, which is projected to be far greater in the eastern suburban counties than in the west. Employment in Lorain and Medina Counties is projected to grow by only 48,000 by 2025, while Lake and Geauga Counties are projected to grow in employment by more than 101,000 jobs. Thus, the center of gravity of employment in the region is forecast to move *east*ward. The projected spatial disconnect between population and employment growth, coupled with the dispersion of employment and population over a larger area, is likely to lead to a pronounced cross-regional daily commuting movement against a background of more dispersed trips that are difficult to serve with public transit service.

Table 2: Change in NOACA Region Employment by County, 1990 to 2025

County	1990 Total	1990 Percent	2025 Total	2025 Percent	Change Total	Change Percent
Lorain	118,065	9.8%	124,816	10.0%	6,751	5.7%
Cuyahoga	903,465	75.3%	803,121	64.2%	-100,344	-11.1%
Lake	103,425	8.6%	169,609	13.6%	66,184	64.0%
Geauga	28,390	2.4%	63,332	5.1%	34,942	123.1%
Medina	47,164	3.9%	89,174	7.1%	42,010	89.1%
Total	1,200,509	100.0%	1,250,052	100.0%	49,543	4.1%

GIS analysis of 1990 Census Data and 2002 projections of population, employment and other demographic data about the region, which is found in the Appendix A to this report, further document the outward movement of population and employment from Cleveland; falling population density and shifts in income distribution in the region. As these maps show, population density in the inner-areas of the Cuyahoga County is falling, while it is rising in outer suburban and formerly rural areas. However, except for a few scattered block groups, vehicle ownership is generally rising—particularly in the lower income, inner-city neighborhoods that form the core of transit ridership for GCRTA and other local bus services.

Travel Patterns

Traffic congestion and other transportation problems are less severe in northeastern Ohio than in many larger and faster-growing regions of the US. However, localized congestion, both on the highways approaching downtown Cleveland and in many suburban commercial areas, can be severe for short periods during peak travel periods. Making transportation safer; addressing environmental concerns; increasing transportation options, particularly for the poor, elderly and disabled; and potential constraints on future economic development caused in part by the lack of choice of public transportation options as compared with other regions of the country that are competitive with Northeast Ohio, are other transportation-related issues facing northeastern Ohio as it enters the new century.

Figure 1 shows the commuter rail corridors studied in NEORail II overlaid on a map of the major highways of northeastern Ohio. The large arrows on that map depict the general transportation corridors that are served by each of the NEORail II commuter alignments. Highway trips generated in each of these travel corridors, especially those oriented to downtown Cleveland, would be affected by, and potentially served by, commuter rail service or other transportation improvements in the corridor. The viability of commuter rail as a practical transportation mode in northeastern Ohio will depend, in large measure, on the potential for commuter rail to address transportation problems and meet other needs in each of those particular corridors, as well as in the region as a whole.

Figure 2 shows general areas where highways in NEORail Corridors 1, 6 and 7level of service operates at highway level-of-service (LOS) “D” or worse during one or both peak periods, in one or both directions. At highway LOS “D,” travelers encounter traffic congestion, marked by slow travel speeds and significant delay compared to operation at free-flow speed. Many of these segments (including much of I-480, I-77, and I-90 East) operate at LOS E or F, which essentially means that travelers experience stop-and-go travel conditions.

Figure 1: Transportation Corridors in Northeastern Ohio Corresponding to NEORail II Corridors

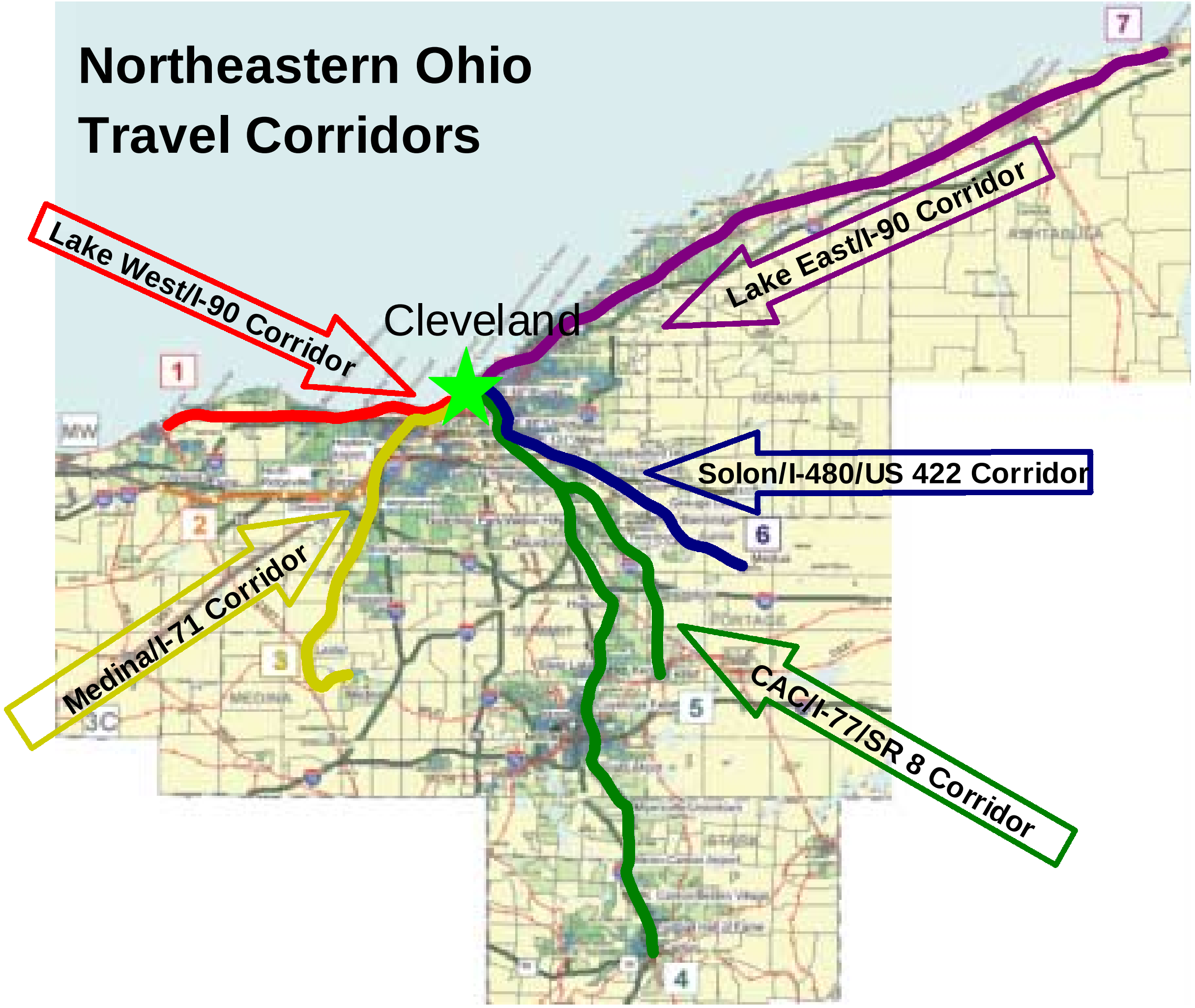
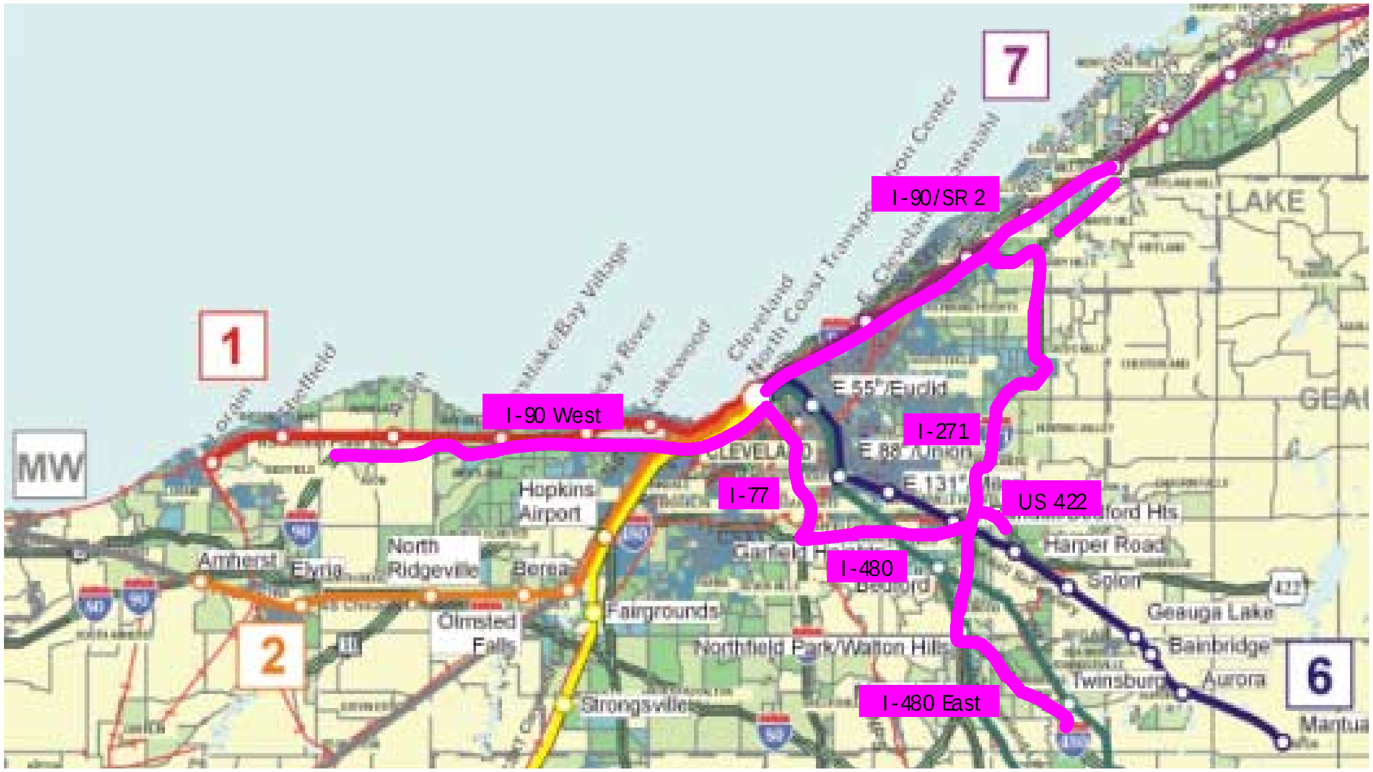


Figure 2: Congested Major Highway Segments Serving Corridors 1, 6 and 7



Source: NOACA, AMATS, based on counts taken between 1988 and 1997.

Serious traffic congestion can also be measured by analyzing reduced travel speed and delay. NOACA's 2000 *Travel Time Study* identifies a number of locations with significant reductions of travel times and delay due to congestion. Table 3 lists those locations:

Table 3: Highway Segments with Significant Delay, 2000

ROAD	FROM WHERE	TO WHERE	SPEED	DELAY
I-480	I-71	SR237	38	0.5 WB P.M.
I-480	W-130TH	I-71	44	0.5 WB P.M.
I-480	SR237-SOUTH EXIT	I-71/I-480 EAST ON-RAMP	49	0.1 WB P.M.
I-480	TUXEDO RD.	I-77	45	0.6 EB A.M.
I-480	I-77 EXIT	77N & ROCKSIDE RD ENTRANCE	40	0.4 EB A.M.
I-480	RT. 21	E-98TH	46	0.1 EB A.M.
I-480	E-98TH	RT. 21	39	0.8 WB A.M.
I-480	E-98TH	BROADWAY	43	0.6 EB A.M.
I-480	BROADWAY	E-98TH	37	1.3 WB A.M.
I-480	BROADWAY	CAMDEN	33	2.2 EB A.M.
I-480	BROADWAY	CAMDEN	45	0.9 EB P.M.
I-480	CAMDEN	BROADWAY	40	1.2 WB A.M.
I-480	CAMDEN	I-480 EAST SPLIT	41	0.4 EB A.M.
I-480	I-480 SPLIT	CAMDEN	27	0.3 WB A.M.
I-480	I-480 SPLIT	CAMDEN	35	0.1 WB P.M.
I-480	I-480 SPLIT	CAMDEN	46	0 WB OFF PEAK
I-480	I-271	SR8	40	0.9 NB A.M.
I-271	SR422	EMERY RD.	48	0 NB A.M.
I-271	FORBES RD	I-480 WEST SPLIT	45	0.7 NB A.M.
I-271	I-480 EAST SPLIT	FORBES RD.	49	0.7 NB A.M.
I-90	ONTARIO	PROSPECT	46	0 EB A.M.
I-90	PROSPECT	ONTARIO	27	1 WB P.M.
I-90	CHESTER	PROSPECT	44	0 WB OFF PEAK
I-90	CHESTER	PROSPECT	25	0.7 WB P.M.
I-90	SUPERIOR	CHESTER	44	0.1 WB OFF PEAK
I-90	SUPERIOR	CHESTER	23	0.7 WB P.M.
I-90	LAKESIDE	SUPERIOR	49	0 WB A.M.
I-90	LAKESIDE	SUPERIOR	13	1.3 WB P.M.
I-90	E55TH	LAKESIDE	37	0.2 WB A.M.
I-90	E55TH	LAKESIDE	25	2.7 WB P.M.
I-90	MLK	E55TH	46	1.4 WB A.M.
I-90	E-185TH	EDDY RD.	47	0.8 WB A.M.
I-90	E-260TH	RT-2 MERGE	49	0 EB A.M.
I-90	E-260TH	RT-2 MERGE	44	0 EB OFF PEAK
I-90	E-260TH	RT-2 MERGE	42	0.2 EB P.M.
I-90	RT-20 EXIT	RT-20 TO WB I-90 RAMP	47	0 WB P.M.
I-90	I-90WB / I-271S SPLIT	I271N / I-90W MERGE	40	0 WB A.M.
I-90	I-90WB / I-271S SPLIT	I271N / I-90W MERGE	37	0 WB OFF PEAK
I-90	I-90WB / I-271S SPLIT	I271N / I-90W MERGE	45	0 WB P.M.
I-90	I-90 EB / 271S SPLIT	I-90 EB / I-271 N MERGE	39	39 EB P.M.
I-90	VROOMAN RD.	SR44	38	0 WB OFF PEAK
SR-176	DENISON	W14TH	17	0.5 NB A.M.
I-271	CHAGRIN BLVD.	EMERY RD.	35	0.3 SB OFF PEAK
I-271	CHAGRIN BLVD.	EMERY RD.	34	1.4 SB P.M.
I-271	RICHMOND. RD.	ROCKSIDE RD	30	2.9 SB P.M.
I-271	FORBES RD	COLUMBUS RD.	45	0.7 NB A.M.
I-271	I-480W MERGE	FORBES RD.	49	0.7 NB A.M.

Source: NOACA Year 2000 *Travel Time Study*

As the table indicates, significant traffic congestion exists on many of northeastern Ohio's highway segments. Of particular interest in the case of this study are the congested locations on I-90 (which parallels NEORail Corridor 1 west of Cleveland Corridor 7 east of Cleveland); and the segments of I-480 and I-271 east of Cleveland, some of which serve trips in NEORail Corridor 6.

Transportation Planning Issues

NOACA, the MPO serving the most of the three corridors under consideration in this memorandum, is addressing the transportation problems of the region through both improvements to the transportation system and policies to address the underlying causes of traffic congestion and lack of connectivity, such as suburban sprawl and unplanned development.

Conscious of the role that transportation development has had in promoting suburban growth and population and employment migration, NOACA has developed ten regional goals to guide its transportation and environmental decision-making processes. Generally, transportation improvements programmed by NOACA must be consistent with these goals (listed in Appendix B). These goals include promoting compact land use, sensitivity toward the natural environment, and support of existing communities. Alternatives to be considered in Corridor 1 (Lake West/I-90), Corridor 6 (Solon), and Corridor 7 (Lake East/I-90) should seek to address not only traffic congestion, but these goals as well.

NOACA's *Framework for Action 2025* lists a number of planned improvements to the transportation system that impact travel in the NEORail Corridors. Some are directly applicable to the development of commuter rail, such as the development of the North Coast Transportation Center (a "Priority A" project, as listed below in Table 4). Others would address the transportation problems of segments of the corridor through roadway widening, interchange improvements or other transportation improvements. Generally, these improvements are not of the scale and scope of the NEORail II commuter rail corridors, or of highway or transit improvements to serve corridors of the length and size of the NEORail II corridors. Accordingly, these planned improvements would not be considered to be alternatives to commuter rail, although they might be included within any future major investment studies for these corridors.

Table 5: NOACA's Projects with Impacts on NEORail Corridors

	Board Approved
Route 1	Black River Intermodal Transportation Center - Lorain Co.
Route 7	Euclid Corridor TSM Busway and CBD Circulation - Cuyahoga Co.
Route 6	Harvard Road Widening - Cuyahoga Co.
Route 3	Strongsville/I-71 Transit Hub (New Park-N-Ride) - Cuyahoga Co.
Route 3	I-71 Reconstruction and Widening - Medina Co. (From SR 303 to Medina/Cuyahoga Co. line: reconstruct and widen to 3 lanes in each direction)
Route 3	I-71 Reconstruction and Widening - Cuyahoga Co. (From Medina/Cuyahoga Co. line to US 42: reconstruct and widen to 3 lanes in each direction*)
Route 7	I-90/SR 615 Interchange and SR 615 (Center St.) widening - Lake Co.
Route 1	I-90 Widening - Cuyahoga Co. (Lorain Co. line to SR 252 : widen to 3 lanes in each direction before opening new lanes in Lorain County**)
Route 6	SR 91 (SOM Center Rd.) Widening: Sandalwood Dr. to White Rd. - Cuyahoga Co.
Route 1	SR 252 (Columbia Rd.) Widening - Cuyahoga Co.
Route 7	SR 615 (Center St.) Widening - Lake Co.

* HOV Study determined HOV lanes on I-71 are not feasible

** I-90 lanes in both Lorain and Cuyahoga Co. have been studied for HOV use, and it was determined that HOV lanes were not feasible.

	Recommended Level "A" Projects (Those currently undergoing planning analysis, whether MIS, PPA, or environmental study)
All Routes	GCRTA Cleveland CBD/North Coast Intermodal Transportation Center - Cuyahoga Co.
Route 2, 3	GCRTA Red Line Extension to Berea/IX Center - Cuyahoga Co.
Route 3	Snow-Rockside Reconstruction and Widening - Cuyahoga Co.
All Routes	Intelligent Transportation System (ITS) Initial Deployment: US 42/I-71/I-77/I-90/I-480 - Cuyahoga Co.
Route 7	I-90 Widening - Lake Co. (Widen to 6 lanes, add 1 lane in each direction: west of SR 306 to Morley Rd.)
Route 1	I-90 Reconstruction and Widening - Lorain Co. (Ohio Turnpike to SR 57; I-90/SR 57 Interchange; SR 57 to SR 611; SR 611 to SR 83)
Route 6	SR 91 (SOM Center Rd.) Widening: Summit Co. line to SR 43 - Cuyahoga Co.

	Recommended Level "B" Projects (Those that will require planning analysis, but the analysis has not begun)
Route 6	GCRTA Blue Line Extension - Cuyahoga Co.
Route 6	GCRTA Waterfront Line Extension - Cuyahoga Co.
Route 6	Green Rd. Miles to Emery Rd. Widening - Cuyahoga Co.
Route 3	SR 18 (Medina Rd.) Widen to 5 lanes and reconstruct: Windfall Rd. to Summit Co. line - Medina Co.
Route 7	US 20 (Mentor Ave) and N. Ridge Rd. Widening and Intersection improvement - Lake Co.
Route 3	SR 82 (Royalton Rd.) Reconstruct and widen to 4 lanes: Lorain/Cuyahoga Co. line to US 42 and I-71 to I-77 - Cuyahoga Co.
Route 6	SR 87 (Chagrin Blvd.) Reconstruct and Widening to 5 lanes I-271 to Lander Rd. - Cuyahoga Co.
Route 7	SR 175 (Richmond Rd.) Reconstruct and Widening to 4 lanes Highland Rd. to Euclid Ave. - Cuyahoga Co.
Route 7	SR 615 (Center St.) Reconstruct and Widening, and extend Bikeway - Lake Co.

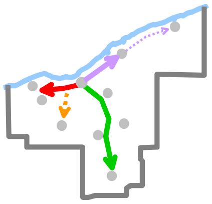
	Recommended Level "C" Projects (Visionary projects and inactive projects)
Route 2	Elyria Industrial Parkway - Phase 3 - Lorain Co.
Route 6	GCRTA Beachwood/Pepper Pike Green Line Extension - Cuyahoga Co.
Route 6	GCRTA Cleveland Heights Rapid Transit - Cuyahoga Co.
Route 2	GCRTA North Olmsted Rapid Transit - Cuyahoga Co.
Route 3	GCRTA Parma Rapid Transit - Cuyahoga Co.
Route 7	GCRTA Red Line Extension to Collinwood - Cuyahoga Co.
Route 2, 3	I-480/Grayton Rd. and I-71 Interchange Modifications - Cuyahoga Co.
Route 6	I-480 New Interchange connecting I-480 with new access road linking Rockside Rd. with SR 17 - Cuyahoga Co.

Source: NOACA *Framework for Action 2025*

Travel Patterns, Issues and Possible Solutions for Travel Corridors

The following sections describe the general transportation challenges facing the corridor, and offer potential solutions that might be considered for addressing those challenges. The list of possible solutions is meant to provide, in general terms, what might be the list of initial alternatives in an alternatives analysis or major investment study of each corridor.

The lists have purposely left out alternatives using ”exotic” technologies, such as monorails, or technologies that are inappropriate to the trip lengths to be served in corridors of this length, such as high speed rail or Maglev (more appropriate for longer distances) or people-movers



(more appropriate for shorter distances). Development of significant new transportation right-of-way, regardless of the transportation mode that would operate on it (roadway, railway, etc.), is also not considered. Given the lack of undeveloped land in most of the congested areas of all the corridors, such development would face unacceptably high development costs, environmental issues as well as environmental justice challenges regardless of the corridor in which it is proposed.

Corridor 1: Lake West/I-90

NEORail Corridor 1, the Lake West Corridor which passes through Lakewood and the Lake West Suburbs to Lorain, is among the most promising mass transportation corridors in Northeastern Ohio. The inner portion of the corridor includes the densely populated Cuddell and Edgewater neighborhoods of Cleveland and the City of Lakewood, one of the most densely populated areas of Cuyahoga County. Beyond Lakewood to the west lie the affluent, but relatively densely populated, suburbs of Rocky River and Bay Village, as well as the fast growing suburbs of Westlake, Avon Lake, Avon and others in eastern Lorain County. The corridor terminates in Lorain, one of northeastern Ohio's larger cities and a significant destination as well as a producer of Cleveland-oriented commuter trips.

Transportation Issues

I-90 in this corridor is congested during peak periods in most segments of I-90 in Cuyahoga County and eastern Lorain County. SR 2 is also congested near downtown Cleveland during peak periods. I-90 connects to downtown Cleveland via the Innerbelt Bridge, which is consistently among the most congested highway segments in the Cleveland area. (Traffic congestion is documented in the Current and Future Transportation Problems and Opportunities in the Corridors section of this report above.) The inner portion of the corridor, from Lakewood east, is well served by express bus and rapid transit service; western Cuyahoga County suburbs are connected to downtown Cleveland by express bus service, including a dedicated park-and-ride bus serving the Westlake Park-and-Ride lot, located near I-90 and Columbia Roads. GCRTA buses extend only a short distance into Lorain County, and there is no public bus service from Lorain or Medina to downtown Cleveland.

Alternative Solutions

In addition to commuter rail as proposed in the NEORail II study, the following options exist for improving transportation in the Lakewood-Lorain corridor:

- TDM/TSM/ITS improvements to increase the efficiency of the existing transportation network; including bus system expansion and enhancements;
- Highway Improvements:
  - Widening of I-90 and SR 2 (the West Shoreway) with general purpose or HOV lanes;
  - Converting Clifton and/or Hilliard Boulevards to variable direction lanes
- Light Rail Transit
  - in Clifton Boulevard Median
  - on NS (former Nickel Plate) alignment – assumes rail freight service on this line is curtailed or eliminated during the hours of passenger service

        - Connecting to North Coast Transportation Center Site (via new Cuyahoga River Bridge)
        - Joining GCRTA Red Line at GCRTA West Blvd. Station with through service to Tower City and University Circle
        - Terminating at GCRTA West Blvd. Station with transfer to GCRTA Red Line
- Heavy Rail – assumes rail freight service on this line is curtailed or eliminated during the hours of passenger service
    - on NS (former Nickel Plate) Alignment
        - Connecting to North Coast Transportation Center Site – requires new Cuyahoga River bridge dedicated to transit use
        - Joining GCRTA Red Line at GCRTA West Blvd. Station with through service to Tower City and University Circle
- Busway
    - in or adjacent to I-90
    - in or adjacent to SR 2 (West Shoreway)
    - on former CSXT (former NS) alignment
        - Connecting to Tower City and GCRTA Rail Lines at GCRTA West Blvd. Station
        - Terminating at GCRTA West Blvd. Station
    - Peak period bus *lanes* (not dedicated busway) in Clifton Boulevard.
- Commuter rail variations and alternatives
    - Alternative eastern terminal & service scenarios
        - Terminate service in downtown Cleveland
        - Through service extended to Aurora/Mantua
        - Through service extended to University Circle
        - Through service extended to University Circle and Painesville
        - Through service extended to University Circle and Collinwood
    - Supplemental service between Lorain and West Blvd. Red Line station (increases service frequency without adding trains to NS line across Cuyahoga River)
    - Extension of service westward to Vermilion and/or Sandusky (Cedar Point)
    - Federal Railroad Administration (FRA)-compliant Diesel Multiple Units (DMUs) vs. traditional push-pull equipment
- Multimodal/hybrid alternatives
    - Peak commuter rail (push-pull) to NCTC via existing NS lift bridge, supplemented by electric, diesel or dual-power light rail to Tower City via FRA-compliant DMUs (in lieu of traditional push-pull equipment)
    - FRA-compliant DMU or dual-power MU service via Tower City (Lorain-Painesville), in mixed traffic with GCRTA through Tower City

Opportunities and Challenges to Alternative Solutions

- Highway Improvements:
    - Highway connections to downtown Cleveland in this corridor are dependent upon the outcome of the Innerbelt Study, which is examining traffic issues and

recommending improvements to SR 2 (the West Shoreway) and the connection of I-90 west of Cleveland to the Innerbelt Bridge.

- Portions of I-90 in western Cuyahoga County and in Lorain County have median and shoulder available for widening.
- Most of I-90 east of Rocky River has limited or no shoulders or median, or adjacent right-of-way, to permit widening without costly and controversial property takings.
- Widening of SR 2 is effectively precluded by the lack of available median and significant shoulders. Widening to adjacent lane is precluded by pre-existing development and the topography of the adjacent terrain.
- Highway widening, particularly for general use lanes, faces environmental challenges due to pollution, and is frequently opposed by residents of areas near the highway. Highway widening concentrates traffic on highways and may induce additional trip-making by auto, and thus often is only a short-term solution to traffic congestion.
- Implementation of reversible lane schemes on Clifton Boulevard and Hilliard/Franklin Boulevards would increase capacity on the transportation system in the corridor. However, the introduction of such a scheme raises short-term safety concerns during the implementation period due to driver confusion, and might be opposed by local residents due to the complication it would cause to their local travel patterns.

- Light and Heavy Rail:
  - Implementation of GCRTA light rail or heavy rail service on the CSXT (former NS and Nickel Plate) alignment would enhance transit service to the corridor, particularly if coupled with extension of service on an extended Waterfront Line through the eastern portion of downtown Cleveland.
  - Any alternative which can use the GCRTA heavy rail viaduct for the Cuyahoga River crossing, whether using commuter rail, light or heavy rail or busway as the transport mode, avoids the added expense and complication of a new lift bridge at the Cuyahoga River, which could result in a significantly reduced cost compared to alternatives which require the new lift bridge.
  - West of Rocky River, development densities may be too low to warrant the frequency of light or heavy rail transit service. Should the line connect to Cleveland via passenger transfer at the West Boulevard Rapid Station, ridership would suffer from the transfer penalty caused by the forced transfer to the existing Red Line.
  - The most challenging issue facing light and heavy rail service could be the impacts on local traffic and on adjacent properties caused by frequent rail transit service on the more than 30 grade crossings between W. 110th Street in Cleveland and W. Clifton Boulevard in Lakewood.
  - Light or heavy rail service terminating in Cuyahoga County would fail to provide much benefit to the western areas of the corridor in Lorain County.
  - Conversion of the existing tracks to a light or heavy rail line, assuming existing local technology, would require costly electrification and signal improvements, would restrict freight rail movements to late night hours when the service was not in operation, and would restrict high or wide freight movements from use of

    the alignment. Adding new trackage for passenger service would be less disruptive to freight service, but would entail additional expense.
  - Heavy rail service has several drawbacks in comparison to light rail. Heavy rail generally assumes full grade separation, which is impossible with crossing auto and adjoining freight traffic, and high-platform stations that would be more difficult to site and develop than low-platform light rail stations. The strength of heavy rail service in this particular case is that it is compatible with the existing east side red line
- Busway:
  - Development of a two-way busway in the railway right-of-way would allow for throughput of some existing bus routes and would reduce impacts on neighboring land uses. However, conversion of the existing rail right-of-way to a busway could preclude, or greatly complicate, use of the line for freight rail through trips and deliveries.
  - A single-direction busway, with proper separation from the rail alignment, could be built in the existing rail right-of-way. Such a busway could be used during peak periods to bypass congestion and provide a more direct routing for the bus; however, the alignment would bypass arterials such as Clifton Boulevard that are currently the focal point of transit use in the corridor. In addition, placement of a grade-or barrier-separated busway in the alignment would reduce the usefulness of the railway line for local freight deliveries by eliminating access to the north side of the alignment.
  - The busway would probably terminate at the West Boulevard Red Line Rapid Station, and its ridership would suffer from a transfer penalty for the forced transfer to the Red Line rapid at that point.
  - Development of a busway in the I-90 or SR 2 right-of-way would face challenges similar to those faced by widening for general purpose or HOV lanes.
  - Development of peak period bus lanes, particularly in Clifton Boulevard, would provide a positive benefit to transit in that corridor at minimal cost in capital investment or traffic disruption.

Corridor 6: Solon-Aurora-Mantua (I-480; I-271; US 422)

NEORail II Corridor 6 originates in largely rural Portage County. The corridor includes fast-growing residential areas in Portage and Geauga County along I-480 East and US 422. Solon and the surrounding south-eastern suburbs of Cuyahoga County are among the fastest growing regions of the County in terms of both jobs and population, and the US 422 corridor is also a fast growing residential area. The northern portion of the corridor also includes the established employment areas around the I-271-Chagrin Boulevard Area and the anticipated Highland Hills development, which could add tens of thousands of jobs to that already large employment area. West of I-271, travel patterns remain dispersed, with travelers using I-480 and I-77 to complete their trip to downtown, or using arterial roads through the inner suburbs and Cleveland to travel to downtown Cleveland and University Circle. Served by two light rail lines and numerous express and local bus routes, the corridor has high transit ridership, mainly in the largely urban inner part of the corridor.

Transportation Issues

The greatest transportation issue facing this corridor is the relative indirectness of freeway connections between the eastern suburbs of Cleveland and downtown. There is no direct freeway access through the inner suburbs and city neighborhoods of Cleveland's east side. Travelers from this area to downtown generally use a circuitous routing involving I-480 East or US 422 connecting to I-271, to I-480, to I-77. The only alternatives to this are routings using arterial roadways, or public transit service. The lack of freeway alternatives in the region, coupled with traffic generated by the large number of employment sites in the Chagrin Boulevard-I-271 area, makes the I-480/I-271 area one of the most congested areas of the Cleveland area's highway system. Completion of I-490, which would have cut the corner formed by I-480 and I-77 on the east side of Cleveland, was to be developed on new right-of-way. However, this road was only completed as far east as East 55th Street, and NOACA removed the alignment from their transportation plan in 1979.

The large and growing number of employment sites in this corridor makes it a prime area for reverse commuters from low-and moderate-income areas of Cleveland and the inner suburbs, many of whom are transit-dependent. The corridor is served by existing public transit service, including the GCRTA Blue and Green Line mass transit services and several local and express bus services. However, the rail transit service stops short of I-271 and has not been extended for many years, during which development has extended far east across the eastern and southern edges of Cuyahoga County into Geauga, Portage and Summit Counties.

Alternative Solutions

In addition to commuter rail as proposed in the NEORail II study, the following options exist for improving transportation in the Solon-Aurora-Mantua corridor:

- TDM/TSM/ITS improvements to increase the efficiency of the existing transportation network; including bus system expansion and enhancements;
- Highway Improvements:
  - Widening of I-480, US 422, I-271 and I-77 (widening of I-480 west of I-271 and I-77 is under consideration as part of the Canton-Akron-Cleveland MIS) for general purpose or HOV lanes.
  - Variable-direction lanes on Cedar Road between Fairmount and I-271.
- Light Rail
  - Blue Line extension to I-271 Harvard (subject of recently completed Blue Line MIS)
  - Green Line extension to I-271.
  - Light Rail on Randall Secondary alignment (NEORail II Corridor 6)
    - merging with Blue/Green Lines at Kinsman Yard, with through-service to Tower City and Waterfront Line.
    - merging with Blue/Green Lines at E.34th Street, with through-service to Tower City and Waterfront Line – requires grade-separated crossing of NS at Erie Crossing
    - to University Circle and Collinwood or Windermere via Kinsman Connection and CSXT Short Line ROW
  - Potential diesel or dual-power light rail (to avoid high cost of electrification)

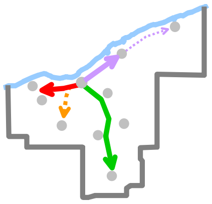
- Heavy Rail
  - Heavy Rail on Randall Secondary Alignment, continuing to west side Red Line and Waterfront transit lines.
- Busway
  - Busway on Randall Secondary Alignment –
- Alternate Commuter Rail Scenarios / Commuter Rail Service Variations
  - Alternative eastern terminal & service scenarios
    - Terminate service in Aurora
    - Terminate service in Mantua with most trains turning at Aurora and limited peak service and seasonal Six Flags service from Mantua
    - Terminate service in Mantua, with full service to Mantua
    - Staged implementation, with initial terminus at Aurora and future extension to Mantua
  - Alternative western terminal & service scenarios
    - Terminate service in downtown Cleveland
    - Through service to Lorain via NCTC
    - Through service to Hopkins Airport via NCTC and new Cuyahoga River bridge
  - University Circle service options
    - Supplemental peak service to University Circle (via Kinsman Connection)
    - University Circle as alternate destination (inferior ridership potential)
  - Alternative Cleveland east side station locations (E.79th/Red Line, Kinsman Yd./Shaker Rapid)
  - DMUs vs. traditional push-pull equipment

Opportunities and Challenges to Alternative Solutions

- Highway Improvements:
  - Portions of I-480 and US 422 east of I-271 have median and shoulder available for widening.
  - I-271 and I-480 west of I-271 have limited or no shoulder or median available for widening
  - Highway widening, particularly for general use lanes, faces environmental challenges due to pollution, and is frequently opposed by residents of areas near the highway. Highway widening concentrates traffic on highways and may induce additional trip-making by auto, and thus often is only a short-term solution to traffic congestion. Highway expansion is generally opposed to regional goals promoting compact development and support of existing communities.
  - Extension of the existing Carnegie-Cedar reversible lane scheme to eastern portions of Cedar Road would increase capacity on this important and often congested arterial. However, the introduction of such a scheme raises short-term safety concerns during the implementation period due to driver confusion.
- Light and Heavy Rail:
  - Extension of the existing GCRTA Blue Line LRT to the Harvard Road/I-271 Interchange area is recommended as the preferred alternative of the Blue Line

MIS. This improvement could be coupled with extension of service on an extended Waterfront Line through the eastern portion of downtown Cleveland, and to Cleveland Hopkins Airport via the west side Red Line. However, this extension would require travelers from the eastern portion of the corridor to drive or ride a bus through the most congested portions of I-480 East and US 422 before entering the park-and-ride lot at Harvard/I-271, thus removing one of the main incentives to use transit—namely, avoidance of congestion.

  - Extending the Green Line is practically precluded by GCRTA's sale of a portion of the alignment to the City of Beachwood in 1999. A Green Line extension to I-271, like the Blue Line extension, would improve connections to downtown and to the airport. However, this extension, like the Blue Line extension, would require travelers to traverse the most congested portions of I-480 East, US 422 and I-271 to reach the park-and-ride lot, thus removing the avoidance of congestion as an incentive to use transit.
  - Extension of the Blue or Green Lines to connect to the Randall Secondary alignment would require new right-of-way, probably along I-271, to connect the two rail lines. This new alignment would face many of the cost and environmental challenges that would be faced by new highway right-of-way or highway widening.
  - Extension of light or heavy rail on the Randall Secondary alignment would provide high quality service connections to downtown Cleveland, with possible through routing on the Waterfront and west side Red Lines. However, population densities east of I-271 may be insufficient to warrant the frequency of service typical of light rail systems. Moreover, using existing technology (overhead wires for electrical pickup) would create significant capital costs. Operation of light or heavy rail on this line would also severely curtail its usefulness for freight rail deliveries or through service, restricting freight rail movements to late night hours during which the light rail service is not in operation.
  - The more frequent station spacing and slower running speed of a light rail system would add significantly to the running time, offering a much slower ride to Tower City from outer stations on the system.
- Busway:
  - Conversion of the Randall Secondary Line to a busway would likely not attract as many riders as commuter rail or light rail, and would eliminate the usability of the line for freight rail service.
- Alternate Commuter Rail Scenarios
  - Terminating service in Aurora in an initial phase of development would significantly reduce capital and operating costs without large reductions in ridership. However, locating a large terminal park-and-ride lot in Aurora may be difficult given local development. In addition, such termination would significantly reduce Portage County's financial commitment to the project, which would result in a higher portion of the costs being borne by Cuyahoga and Geauga County.



Corridor 7: Lake East/I-90

Corridor 7 encompasses the portions of northeastern Cuyahoga County, Lake and Ashtabula Counties, which are served by I-90. Corridor 7 is the longest of the three corridors examined by this memorandum, extending more than 60 miles from downtown Cleveland into Ashtabula County. The corridor is also denser and more highly urban along a longer distance than the other two corridors, owing to the existence of the older and denser lakefront communities of Lake County

Transportation Issues

As noted in the “Current and Future Transportation Problems and Opportunities in the Corridors” section of this memorandum, travelers using I-90 and SR 2 east of downtown Cleveland encounter significant peak period traffic congestion and delay. The relative lack of alternatives to I-90 for travel to downtown Cleveland and other employment sites in Cuyahoga County is part of the reason for this congestion. I-90 is the only available freeway connection, has a sharply curving alignment, and is adversely affected by winter weather due to its close proximity to the Lake in this corridor, giving it a high accident rate. This corridor, like the Lake West (Lakewood-Lorain) Corridor, is impacted by the transportation problems being addressed by the Innerbelt Study and related schemes for redeveloping Cleveland’s Lakefront east of the Cuyahoga River. Travelers in this corridor, particularly in the inner, western portions of it, will also benefit from GCRTA’s planned Euclid Corridor Improvement Project and the proposed extension of the Waterfront Line to the eastern edge of downtown. GCRTA’s Red Line Rapid Transit, which terminates at Windermere in East Cleveland, stops far short of serving the relatively dense development in this corridor, which continues eastward into Lake County. LakeTran’s express bus serving the corridor is delayed by the traffic congestion in the corridor, reducing its potential for providing options and relieving congestion in the corridor. The heavy volume of traffic on CSXT’s main line—the alignment of the Lake East Corridor—which is heavier than on the former Nickel Plate or Randall Secondary lines in the other corridors this memorandum is considering—will make implementation of commuter rail service more challenging than in the other corridors, and will preclude heavy or light rail or busway development in the right-of-way except, perhaps, on adjacent, grade-separated right-of-way.

Lake County is projected to add more than 60,000 jobs between 1990 and 2025. Many of these jobs will be taken by residents of Lake County, resulting in a projection of considerable intra-county commuting and a general shortening of trip lengths over the period. However, many of these jobs will need to be filled by commuters from adjacent counties, including reverse commuters from the City of Cleveland and lower-income inner suburbs like East Cleveland. Many of these residents are transit dependent. Transit service between Lake County and Cleveland is primarily oriented to carrying commuters from Lake County to Cleveland; travelers in the other direction are generally dependent on local bus services that require transfers at the county lines. As employment in Lake County grows, the need for additional, and more convenient, services will be needed to address the transportation needs of reverse commuters.

Alternative Solutions

In addition to commuter rail as proposed in the NEORail II study, and operation of commuter rail through University Circle via GCRTA's Red Line alignment, which was discussed in a meeting with the City of Cleveland as a potential option, the following options exist for improving transportation in the Lake East corridor:

- TDM/TSM/ITS improvements to increase the efficiency of the existing transportation network, including bus system expansion and enhancements;
- Highway Improvements:
    - Widening of I-90 east of downtown Cleveland
- Light Rail or Heavy Rail
    - Extension of GCRTA Red Line alongside I-90/CSXT Main Line Right-of-Way from East Cleveland to Euclid
    - Extension of GCRTA Red Line alongside NS Nickel Plate Line Right-of-Way from East Cleveland to Euclid
    - Extension of GCRTA Red Line in CSXT Short Line right-of-way from University Circle to Collinwood
    - Extension of the Waterfront Transit Line along I-90/CSXT Main Line to Collinwood or Euclid.
- Busway/Bus Lane
    - Further eastward expansion of the Euclid Corridor Improvement Project from East Cleveland to Euclid.
- Alternate Commuter Rail Scenarios
    - Routing via University Circle, E 55th Street
    - Alternative western terminal & service scenarios
        - Terminate service in downtown Cleveland – NCTC
        - Terminate service in downtown Cleveland – Tower City (new platform east of GCRTA station)
        - Through service to Lorain via NCTC
        - Through service to Hopkins Airport and/or Elyria via NCTC and new Cuyahoga River bridge
    - Alternative eastern terminal & service scenarios
        - End of line at Painesville
        - End of regular service at Painesville, with limited rush hour service to/from Ashtabula County
        - End of regular service at Madison, with additional rail infrastructure
    - Hybrid: FRA-compliant DMU or dual-power MU service via Tower City (Painesville-Lorain), in mixed traffic with GCRTA through Tower City

Opportunities and Challenges to Alternative Solutions

- Highway
    - I-90 has median and right-of-way available for widening in many areas east of I-271. West of I-271, no median exists or adjacent, available right-of-way exists in most areas, and widening could only be pursued at considerable cost. I-90 is constrained in many areas by the CSXT rail line.

- Heavy and Light Rail
  - An extension of the GCRTA Red Line heavy rail service or Waterfront Line light rail service along the CSXT or I-90 right-of-way would be constrained in many areas by the narrowness of the right-of-way and the high volume of freight traffic that uses the line. The high freight volume insures that rail transit could only be operated on adjacent right-of-way, both to maintain separation of the lighter transit vehicles from the freight trains and due to the overhead catenary electrical lines, which would conflict with many freight trains. The narrowness of the right-of-way would prevent development of rail or roadway on adjacent land.
  - Development of dedicated busway would suffer similar fates to the development of other forms of new alignment; however, extension of the Euclid Corridor bus lanes eastward along SR 2 could address much of the need for bus service, if express services in both directions are programmed to operate in the bus lane alignments.
- Alternate Commuter Rail Scenarios
  - Routing via the NS Line through University Circle and E. 55th Street would add approximately five minutes of travel time and costs to the commuter rail running time from Lake County to the NCTC but would add University Circle, a growing secondary employment area, as a major destination in addition to downtown Cleveland.

Appendix A

GIS Demographic Mapping of Northeast Ohio for 1990, Projections for 2002

Appendix B

NOACA Transportation Plan Goals
August 8, 1997

GOAL 1: Advance the region's economic competitiveness based upon a sustainable development approach, integrating environmental, social equity and economic perspectives.

GOAL 2: Enhance the natural environment and ecology of the region by improving air, land and water quality, and by identifying and preserving existing and critical natural resources and environmentally sensitive areas.

GOAL 3: Preserve and improve the efficiency of the existing transportation system, prioritizing elements of the system identified as significant.

GOAL 4: Establish a more balanced transportation system by prioritizing goods movement, transit, rail, pedestrian and bicycle travel instead of just single occupancy vehicle movement and highways.

GOAL 5: Improve the transportation mobility of the transit-dependent to jobs, housing and other trip purposes and provide mode choice for the general population.

GOAL 6: Provide additional transportation system capacity to move people and goods only when such capacity improvements promote the NOACA Principles, minimizing the adverse impacts of the investments on existing communities within the region.

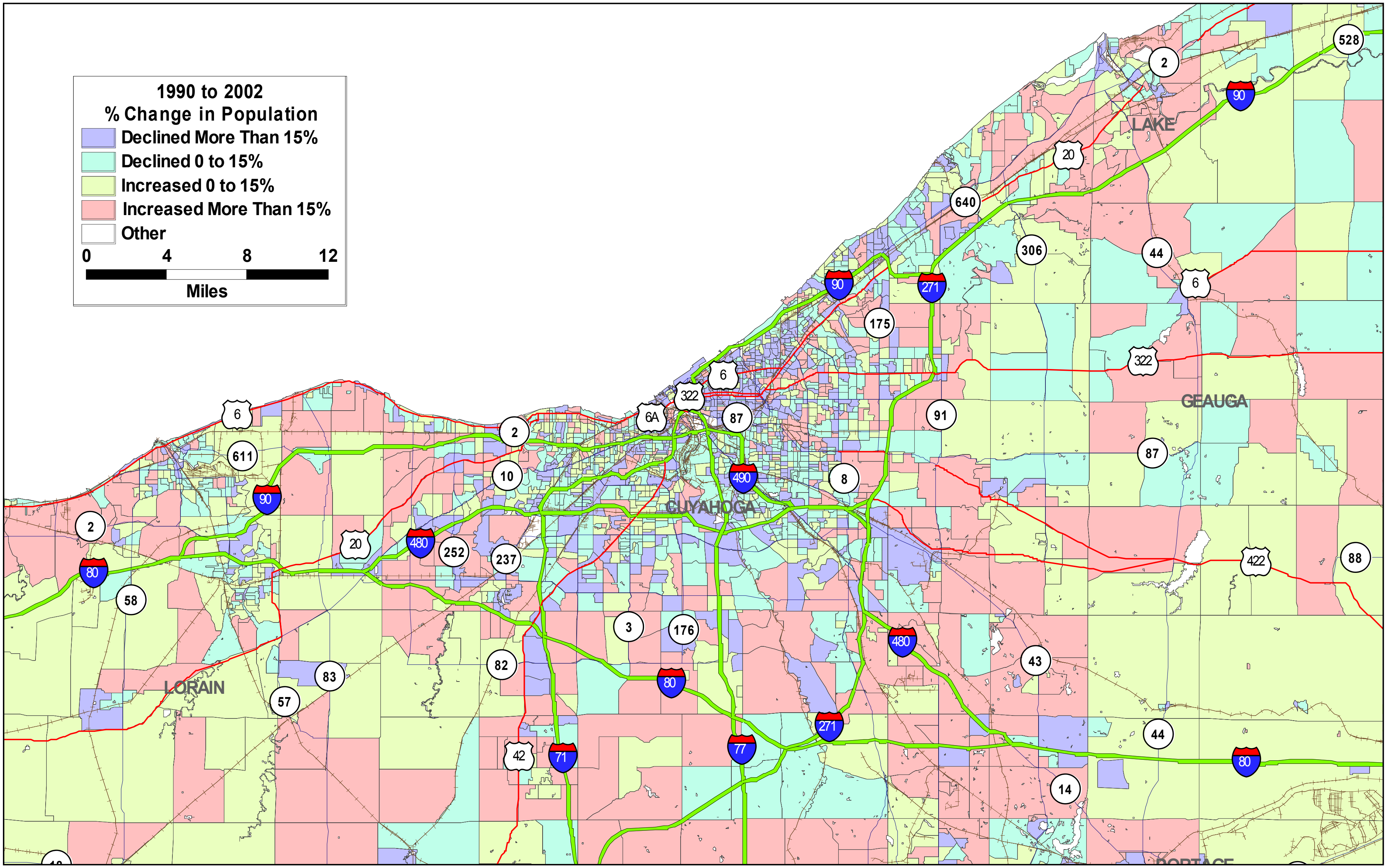
GOAL 7: Foster reinvestment in existing urban core areas throughout the region, and work to target and manage transportation investments to implement Plan goals.

GOAL 8: Foster intergovernmental and private sector relationships to strengthen the regional community and assist in Plan implementation.

GOAL 9: Direct the Plan and its investments toward efficient, compact land use development/redevelopment that facilitates accessibility, saves infrastructure costs, preserves and enhances farmland, forests and open space and enhances the economic viability of existing communities within the region.

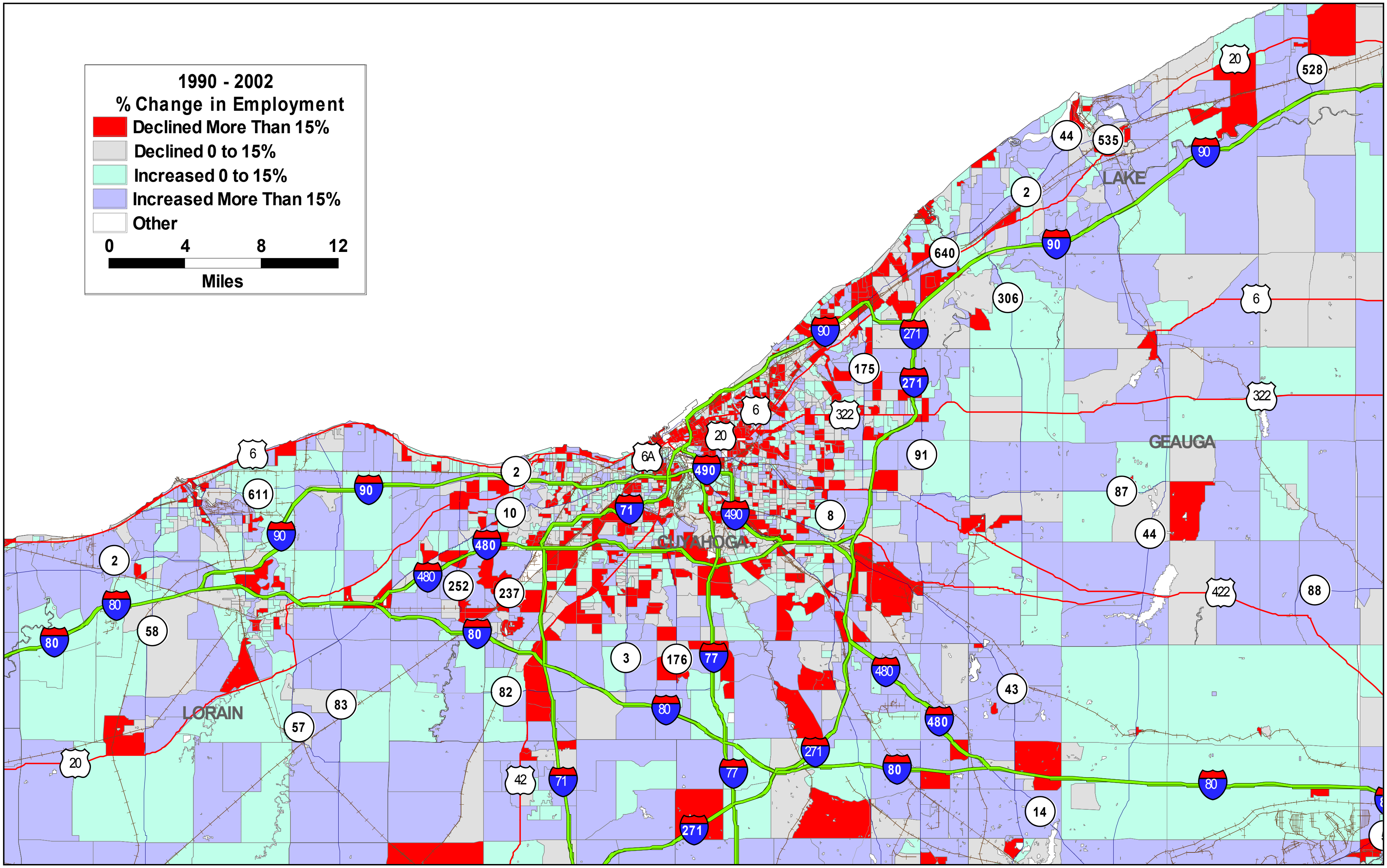
GOAL 10: Foster improvement in the quality of life of residents in the region through attention to aesthetics in the planning of the transportation system.

Change in Population
1990 – 2002



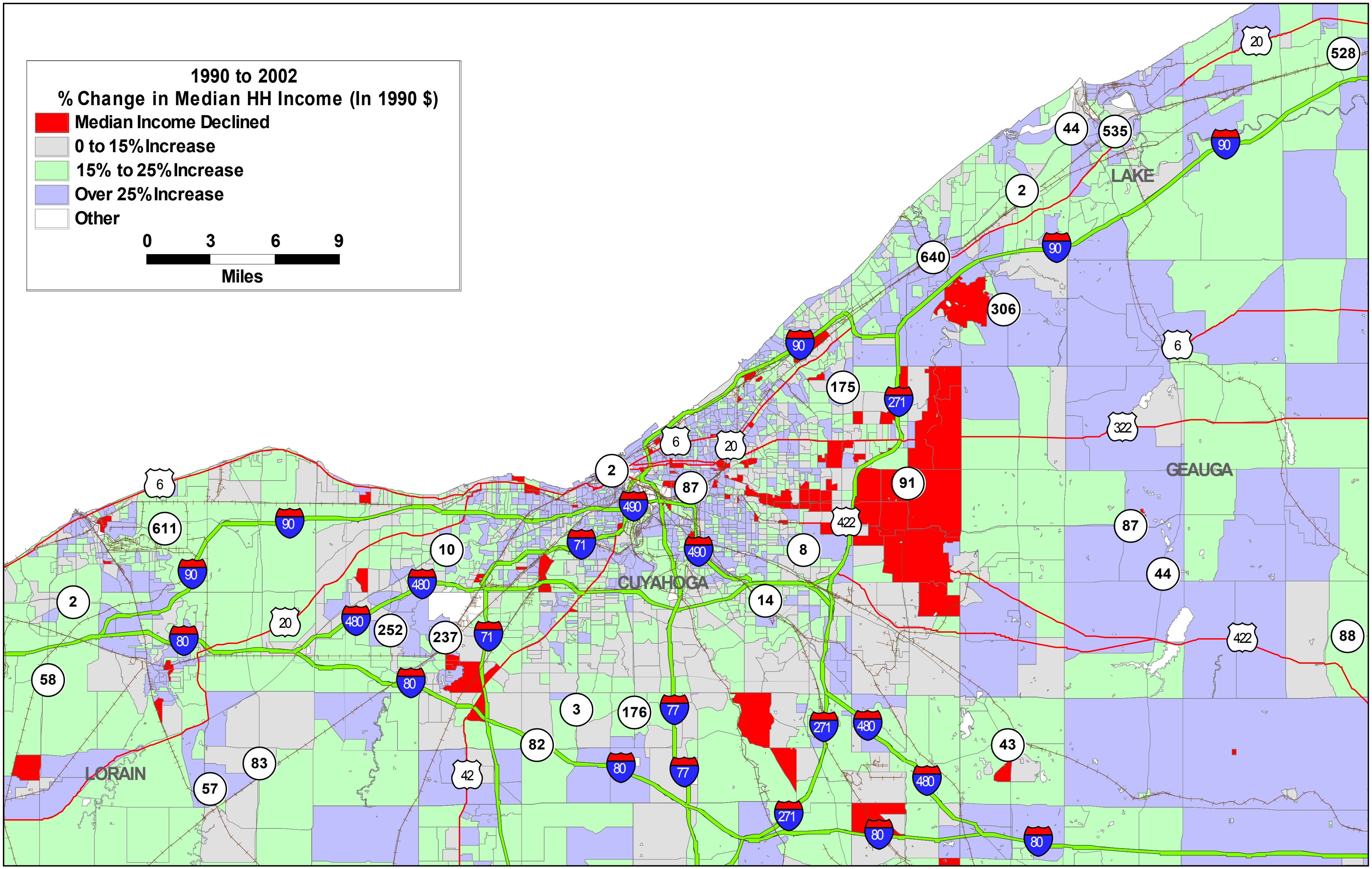
Change in Employment

1990 – 2002



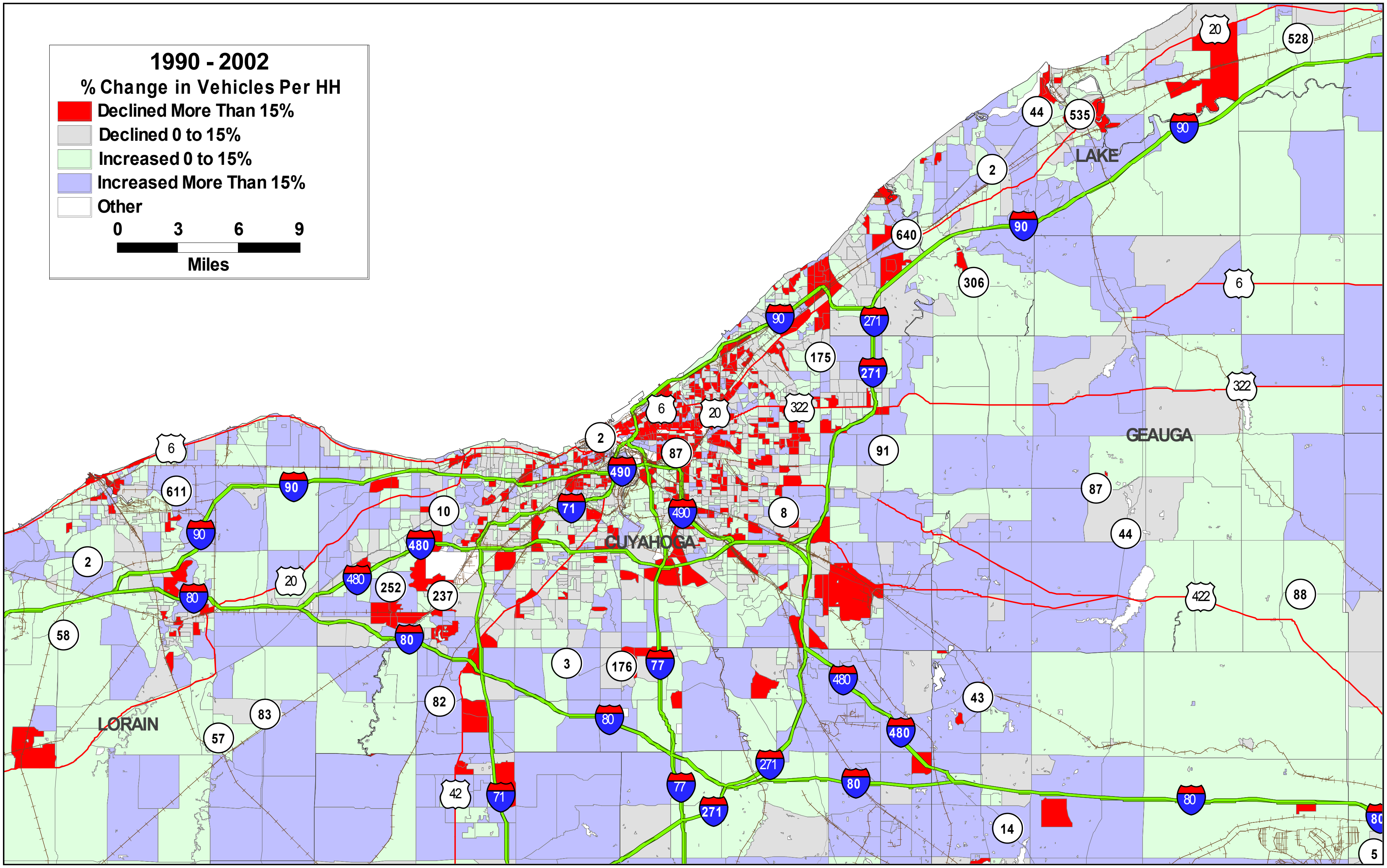
Change in Median Household Income

1990 – 2002

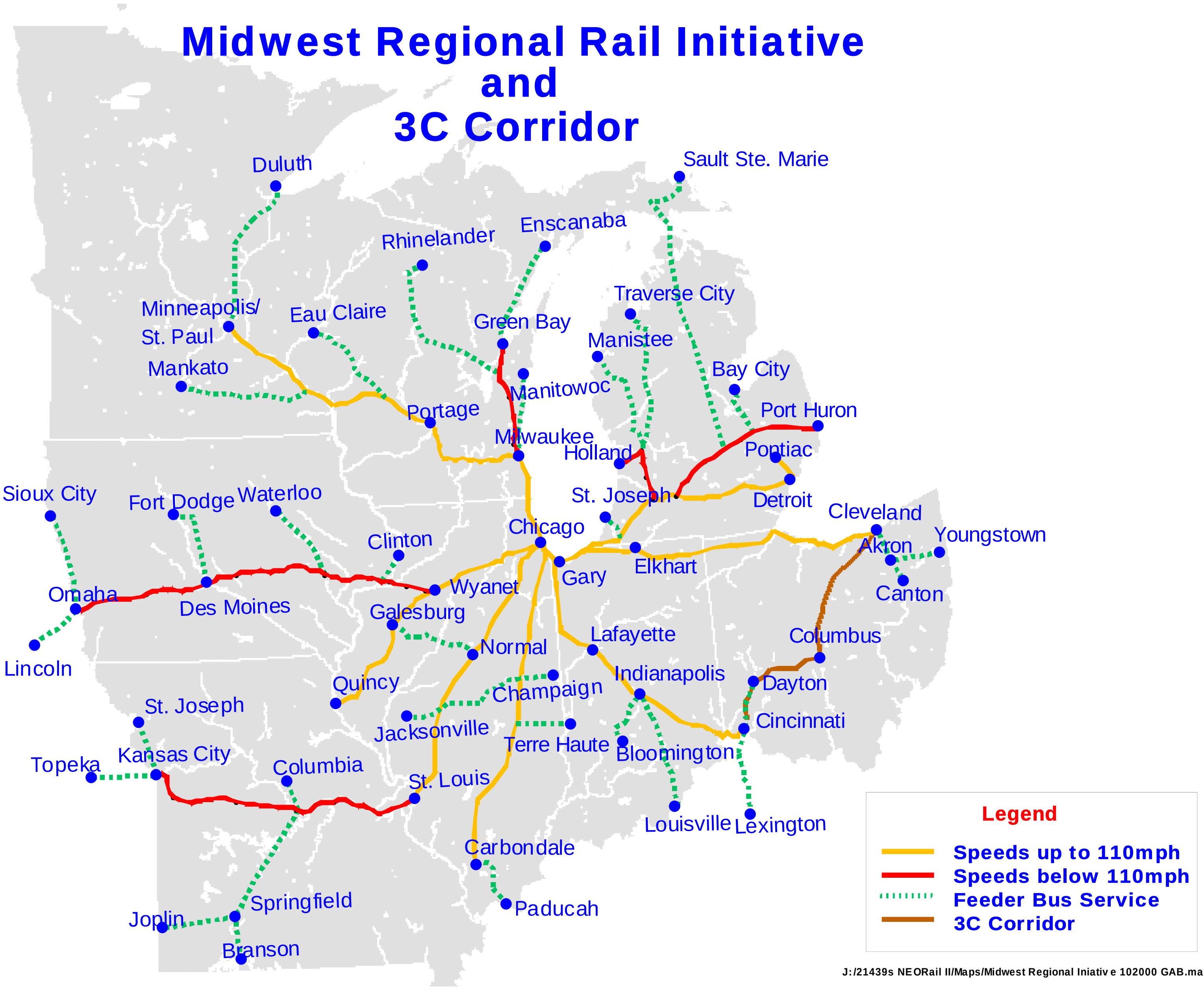


Change in Vehicles Per Household

1990 – 2002



Midwest Regional Rail Initiative and 3C Corridor



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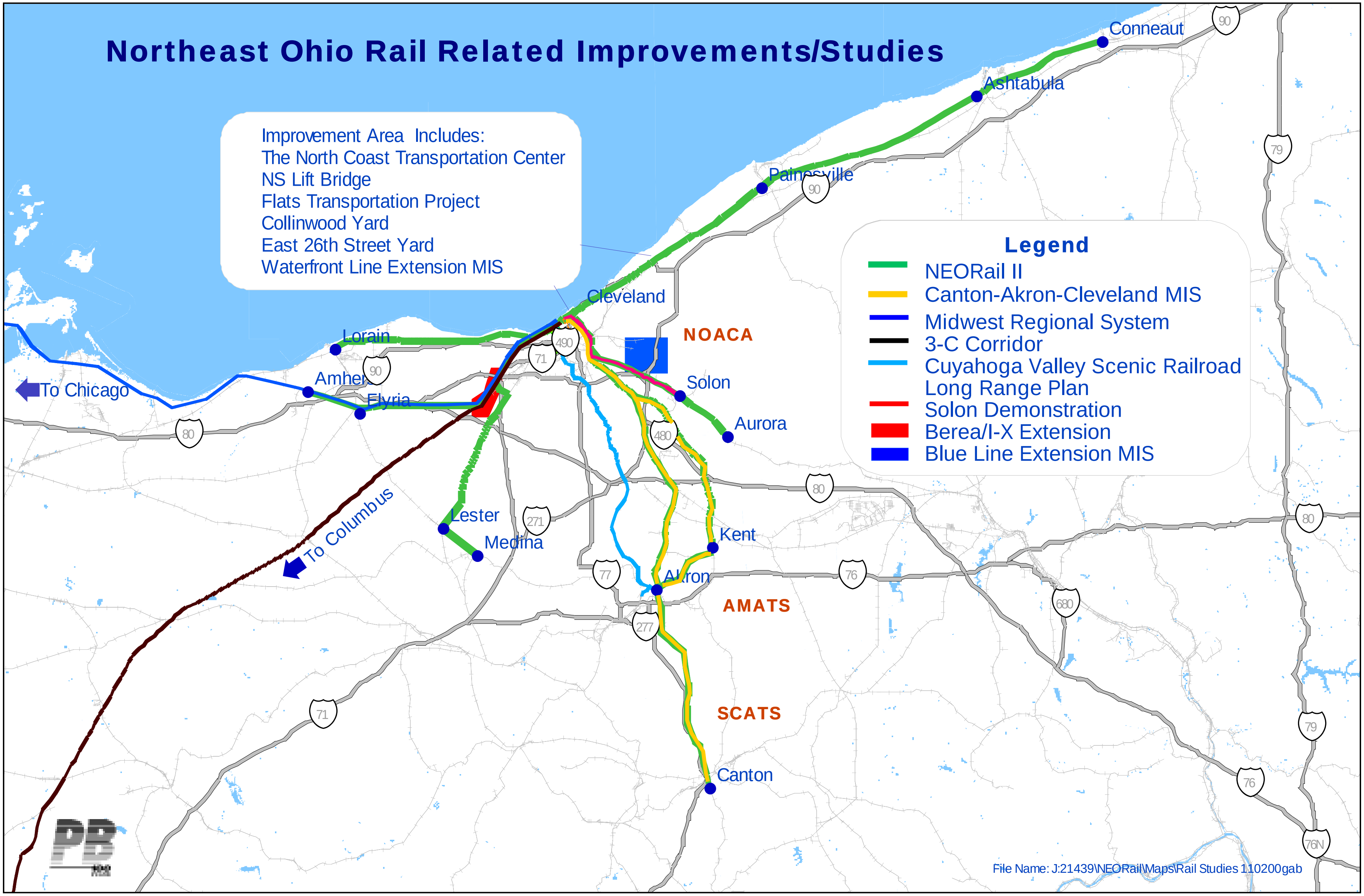
Northeast Ohio Rail Related Improvements/Studies



Improvement Area Includes:
The North Coast Transportation Center
NS Lift Bridge
Flats Transportation Project
Collinwood Yard
East 26th Street Yard
Waterfront Line Extension MIS

Legend

- 🟩 NEORail II
- 🟨 Canton-Akron-Cleveland MIS
- 🟦 Midwest Regional System
- ⬛ 3-C Corridor
- 🟦 Cuyahoga Valley Scenic Railroad Long Range Plan
- 🟥 Solon Demonstration
- 🟥 Berea/I-X Extension
- 🟦 Blue Line Extension MIS

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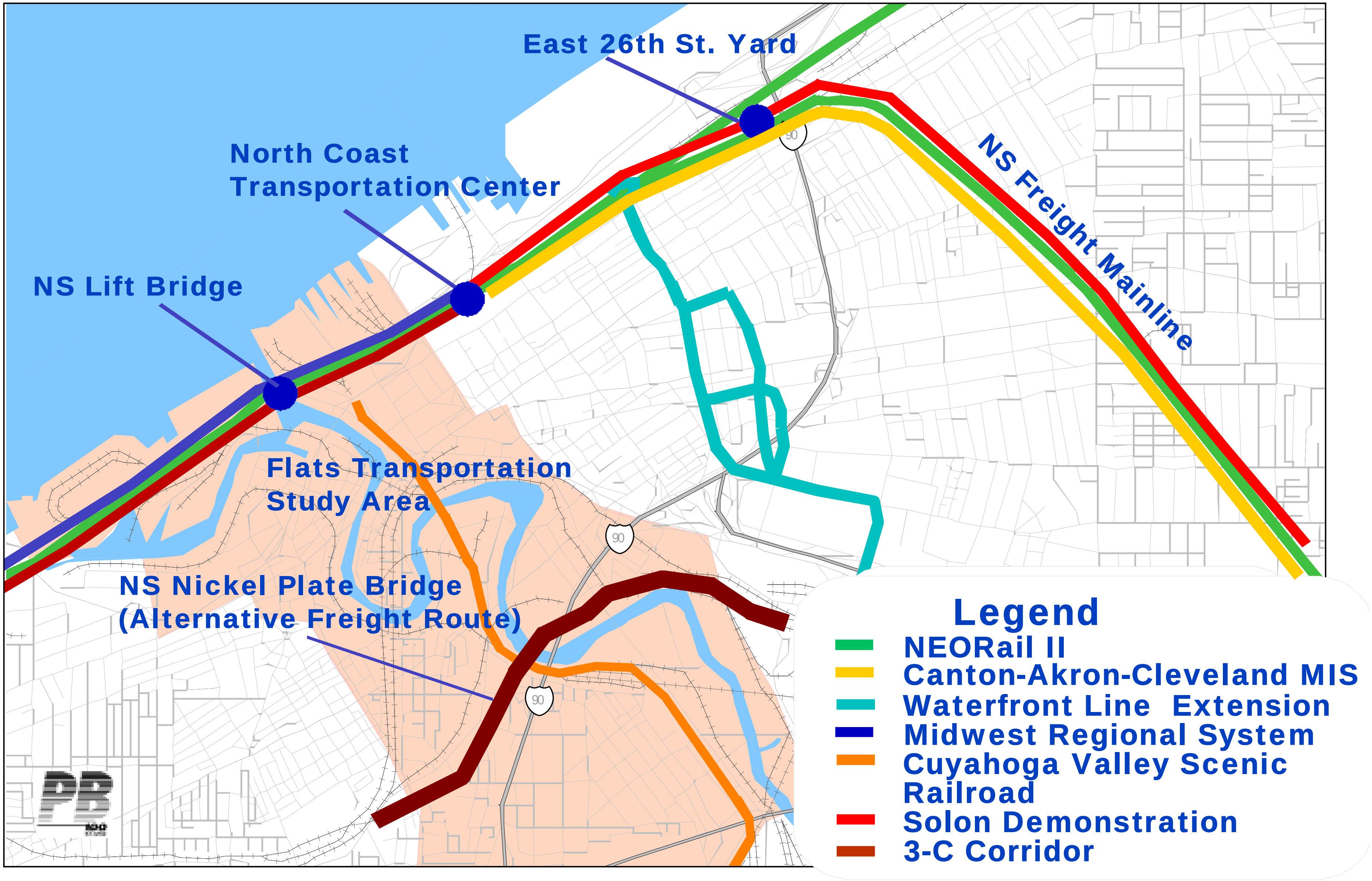
East 26th St. Yard
North Coast Transportation Center
NS Lift Bridge
NS Freight Mainline
Flats Transportation Study Area
NS Nickel Plate Bridge (Alternative Freight Route)
90
90
90
Legend
NEORail II
Canton-Akron-Cleveland MIS
Waterfront Line Extension
Midwest Regional System
Cuyahoga Valley Scenic Railroad
Solon Demonstration
3-C Corridor

Appendix D:
The Effect of Rail Transit on Property Values

APPENDIX D - THE EFFECT OF RAIL TRANSIT ON PROPERTY VALUES: A SUMMARY OF STUDIES

INTRODUCTION

A good transit system provides a high level of access to work and other activities for households and to customers and employees for businesses. The monetary value of this access will be reflected in the value of a home or a business, in addition to the value of other features such as the specific physical attributes of the building and neighborhood characteristics. This paper reviews recent studies on rail transit's effect on property values. A matrix with the key findings of the major studies carried out over the last ten years can be found in the last section.

The impact of rail transit on property values has been studied from many perspectives, including analyses of different types of systems (e.g., rapid, commuter, light rail), of residential versus commercial impacts, and studies that have attempted to isolate both positive and negative effects. The varied approaches make it difficult to compare the results of one study to another. Further, some of the contradictory results over the years have often been due to differing methods of analysis, data quality, and regional differences. Nevertheless, it is clear that in most cases access to rail systems is valued by property owners and there is little support for the suggestion that proximity to rail actually *decreases* property values.

TYPES OF IMPACTS

Evidence for rail's influence on residential property values has been demonstrated more clearly than for commercial uses (Nelson 1998). However, this is due more to data and analysis difficulties than to a lack of effect. Landis et al. (1995) note three reasons for the problem: (1) a lack of comprehensive and reliable data; (2) a smaller zone of impact that limits the number of observations; and, (3) while housing values are determined in the marketplace, the values of individual commercial transactions may represent only the value of one pair of buyers and sellers. More recent studies have attempted to correct earlier analysis problems (Weinberger 2001 and 2000, FTA 2000) and have found statistically significant and positive impacts of light rail (Weinberger) and rapid rail (FTA) on commercial properties. It is likely that the magnitude of the impact on commercial property values will vary according to:

- How much accessibility is improved,
- The relative attractiveness of the locations near the station area, and
- The real estate market in the region (Parsons Brinckerhoff 1999).

It has been theorized that proximity to a rail *line* would have a negative impact on residential property values, due to nuisance effects such as noise and vibration. The nuisance effect has not been conclusively supported, however. Two separate studies, one that focused on proximity to Portland, Oregon's light rail line (Chen et al. 1998), and one that looked at proximity to BART lines (Landis et al. 1995) did not find statistically significant nuisance effects. However, Landis et al. did find an indication of a nuisance effect for houses adjacent to the CalTrain commuter line in San Mateo county. The authors speculate that the disamenity for CalTrain was "probably a function of noise levels that are much higher than BART's" (pg. 38). Further, they suggest that because the "CalTrain trackbed is minimally separated from adjacent uses, and given that the CalTrain train cars are not specifically designed for quiet operation, this is not a surprising finding" (pg. 42). Thus, the problem of nuisance effects is one that can be minimized or negated through good system design.

There is evidence that rapid and commuter rail systems have a greater impact on property values than do light rail transit (LRT) systems (Cervero 1984), due to rapid and commuter rail's higher speeds and greater regional access. The increase in service characteristics gives rapid and commuter rail a greater "sphere of influence" while for LRT, "fewer land parcels can turn gains in accessibility into higher land values" (pg. 134). However, Landis et al. (1995) found equally strong impacts on housing values for BART (a rapid rail system) and for the San Diego Trolley (a light rail system) due to the equally high quality of service these two systems provide. Thus, capitalization benefits depend on "reliable, frequent, and speedy service" to a large market area (pg. 42).

In one of the few analyses to look at commuter rail in particular, Armstrong (1994) studied the impact of Boston's Fitchburg line on residential property values, both in terms of amenity and nuisance values. Armstrong found that homes located within census tracts that have rail stations commanded a 6.7 percent premium for home sale prices. When he looked at the effect of proximity to the rail line itself (measured as a home being within 400 feet of the line), Armstrong found an approximate 20 percent decrease in value. He cautions that firm conclusions cannot be drawn from this finding due to the fact that the commuter rail line shares right-of-way with a freight system along this line. "The fact that both freight rail service and commuter rail service operate upon the Fitchburg line . . . makes it difficult if not impossible to accurately differentiate between the two separate sources of proximity impacts. Therefore, the findings concerning the effects of commuter rail generated proximity impacts, independent of freight rail generated proximity impacts, are inconclusive" (pg. 26).

As noted above, property value impacts tend to be highly localized around rail stations (particularly for commercial uses), which suggests that great attention must be given to the location of stations and the policies that guide development around them. The next section reviews these policies.

OTHER INFLUENCES

Development does not occur automatically. Importantly, policy and institutional factors, the land market, and the overall economic climate will ultimately determine whether or not transit will positively impact property values and land development. Previous work has identified a veritable laundry list of important policies and tools, and we suggest that the following deserve special emphasis:

Regional tools:

- Keeping urban growth and development in desired areas with such tools as urban growth boundaries, agricultural reserves, and greenbelts will help to increase the amount and intensity of development in station areas, which will in turn help to increase ridership.
- Development guidelines that locate major activity centers, government facilities, and residential uses on transit lines will support higher levels of ridership.
- Development of a regional vision that puts transit first.
- Automobile restraint programs, such as restricting parking supply will encourage transit use by increasing the cost of using automobiles.

Station-area tools:

- Innovative zoning, such as density bonuses, mixed-use zoning, and transfer of development rights will facilitate the type of development that will best serve a transit-using public.
- Design guidelines that emphasize a pedestrian-friendly (and pedestrian-interesting) and a “human-scaled” environment are crucial to the creation of station areas that people will enjoy being in.
- Strategic selection of station areas that will take full advantage of land availability, development and/or redevelopment potential and local demand.

SUMMARY of STUDIES: RAIL TRANSIT'S EFFECTS ON PROPERTY VALUES
Rapid/Commuter Rail

Location, (Author, Year Published)	**Rail System**	**Type of Property Studied**	**Result**	**Comments[1]**
Washington, D.C. (FTA 2000)	Rapid rail: Metro	Commercial	Price per square foot decreases by about $2.30 for every 1,000 feet further from station.	City-wide analysis of over 2,800 commercial properties. Access measured as ground distance to nearest Metro station.
Atlanta (Nelson 1998)	Rapid rail: MARTA	Commercial	Price per square meter falls by $75 for each meter away from transit stations. Price rises by $443 for location within special public interest districts.	City-wide analysis measuring access as ground distance to a MARTA station. Study also looked at the effects of special policy districts.
San Francisco (Lewis-Workman and Brod 1997)	Rapid rail: BART	Residential	Average home prices decline by about $1,578 for every 100 feet further from station.	Study area defined as one-mile radius from a single station area (Pleasant Hill). Access measured as ground distance to station
New York (Lewis-Workman and Brod 1997)	Rapid rail: New York City MTA	Residential	Average home prices decline by about $2,300 for every 100 feet further from the station areas.	Study area defined as one-mile radius from three different station areas (Forest Hills, 67 Avenue, and Rego Park). Access measured as ground distance to station.
San Francisco Bay Area (Landis et al. 1995)	Rapid rail: BART	Residential and Commercial	1990 single family home prices decline by $1.00 to $2.00 per meter of distance from a BART station in Alameda and Contra Costa Counties. Found no effect for commercial property.	For residential study, measured ground distance to BART stations. Also looked at nuisance values of being adjacent to line and found none. Commercial property observations have significant data problems
San Francisco Bay Area (Landis et al. 1995)	Commuter rail: CalTrain	Residential	Did not find a significant impact on house values from proximity to a rail station. Houses within 300 meters of a CalTrain right-of-way sold at a $51,000 discount.	Access measured as ground distance to nearest station.

Rapid/Commuter Rail, continued

Location, (Author, Year Published)	Rail System	Type of Property Studied	Result	Comments[1]
Washington, D. C. (Benjamin and Sirmans 1996)	Rapid rail: Metro	Residential, Apartment Rents	Rents decrease by 2.4 to 2.6% for each one-tenth mile increase of distance from a Metro station.	Study looked at over 250 rental observations from 81 apartment complexes. Access measured ground distance to nearest station.
Boston (Armstrong 1994)	Commuter rail: MBTA, Fitchburg Line	Residential	Single family residences located in communities that have a rail station have a market value approximately 6.7% greater than those that do not. Also found a property value loss of about 20% for properties located within 400 feet of a commuter or freight rail right-of-way.	Study area was defined as municipalities that fell more than 50% within an area approximately 10 miles from line. Study focused on station areas as well as right-of-way (nuisance) impacts. The nuisance impact may be the result of proximity to freight rail rather than commuter rail.
Los Angeles (Fejarang et al. 1994)	Rapid rail: Metro Rail	Commercial	Commercial space within ½-mile of the rail corridor had an additional $31 increase in mean sale price per square feet over the mean sales price of a comparable control group outside of the rail corridor, between 1980 and 1990.	Studied the effects of the announcement of coming rail service using a test and control group method to compare properties within the corridor to similar ones without.
Philadelphia (Voith 1993)	Rapid rail: SEPTA	Residential	Finds a premium for single family homes with access to rail stations of 7.5 to 8.0% over the average home value.	Access to rail defined according to proximity of a given house to train service, measured in census tracts.

Light Rail Transit

Location, (Author, Year Published)	Facility Characteristics	Type of Property Studied	Result	Comments[1]
Santa Clara, County (Weinberger 2001, 2000; Cambridge Systematics, Inc. 1999)	LRT: Guadalupe line	Commercial	Commercial space within a ¼-mile of a station received an average of 2.3¢ to 5.0¢ more per square foot than space located more than ¾-mile from a station. Office space sold within a ¼-mile of a station received an average of $4.87 per square foot more per gross building square foot compared to space located more than ¾-mile from a station.	County-wide analysis. Access to transit measured as ¼-mile distance rings.
Portland (Dueker and Bianco 1999)	LRT: MAX, Eastside line	Residential	Median house values increase at increasing rates as move toward an LRT station. The largest price difference ($2,300) occurs between the station and 200 feet away.	Study used a test and control group method to compare property values along a parallel bus corridor to those along the rail line.
Portland (Chen et al. 1998)	LRT: MAX, Eastside line	Residential	Beginning at a distance of 100 meters from the station, each additional meter away from decreases average house price by $32.20.	Update of the 1993 study, with a slightly altered study area (including extending the area of influence to 1000 meters)
Portland (Lewis-Workman and Brod 1997)	LRT: MAX, Eastside line	Residential	On average, property values increase by $75 for every 100 feet closer to the station (within the 2,500 ft. – 5,280 ft. radius).	Study area defined as the area within a one-mile radius, but 2,500 feet away, from three station areas (148th Ave., 162nd Ave., and 172nd Ave.). Access measured as ground distance to stations.
Portland (Knaap et al. 1996)	LRT: MAX, Westside line	Residential	The values of parcels located within ½-mile of the line rise with distance from the lines, but fall with distance from the stations.	Study looked at property values in advance of the Westside LRT beginning operations. Study area included land within two to three miles of the line in Washington County. Access measured as ½-mile distance ring.
San Diego (Landis et al. 1995)	LRT: San Diego Trolley	Residential and Commercial	The typical home sold for $272 more for every 100 meters closer to a light rail station. No effect found for commercial impacts	City-wide analysis, access based on ground distance to station

Light Rail Transit, continued

Location, (Author, Year Published)	**Facility Characteristics**	**Type of Property Studied**	**Result**	**Comments**[1]
Sacramento (Landis et al. 1995)	LRT: Sacramento Light Rail	Residential	No effects found	City-wide analysis, access based on ground distance to station
San Jose (Landis et al. 1995)	LRT: San Jose Light Rail	Residential	The typical house was worth $197 less for every 100 meters it was closer to light rail.	City-wide analysis, access based on ground distance to station. Light rail located in commercial, industrial area. Nearby homes are older and serve a lower income households.
Portland (Al-Mosaind et al. 1993)	LRT: MAX, Eastside	Residential	The typical house sold for $663 more for every 100 feet nearer a light rail station.	Study conducted in suburban residential area with seven stations. Only home sales within walking distance (1/4-mile) of stations were analyzed.

[1] Three methods of measuring distance are referred to in this column. “Ground distance” refers to the distance traveled on the ground (i.e., by walking, riding a bike, or driving). This is contrasted to “air distance” which measures a straight-line from the property in question to the transit station. This second method is less precise in measuring actual access to stations. A third method involves the use of rings circling a transit station (usually divided into ¼- and ½-mile segments). All properties within each ring are considered as having the same access.

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Appendix E:
Land Use Brochure

How Can We Implement the Plans?

- Determine which station areas are suitable for developing area plans. Good candidates would include areas that are pedestrian friendly, and where development is supported by local residents and businesses.
- Delineate the station areas within which certain land uses would be mandated or encouraged. Station areas should be an approximate 10-minute walking radius around the station. Time spent "crossing the tracks" counts!
- Specify tracts for housing, retail/service, employment centers, parking, and open space. As an alternative, develop performance standards that apply to any or all areas.
- Revise zoning ordinances to allow for a variety of developments surrounding transit station areas.
- Implement special measures such as Station Area Zones, Special Improvement Districts, or opportunities for public/private partnerships.
- Identify other public improvements and a method for financing them.
- Plan for and provide functional pedestrian connections to and from the station, making sure to:
  1. Allow direct access to nearby office buildings or retail centers; and
  2. Create visual pathways to surrounding commercial, residential, and employment locations.
- Propose land acquisitions for parking and open space.
- Market and promote rail as a mode for bringing both workers and new residents into the area.
- Develop formal and informal interagency agreements, private-public partnerships, and neighborhood/civic partnerships.
- Establish an on-going community involvement program so that stakeholders can be included in the decision-making process.

FOR MORE INFORMATION, CONTACT NOACA @ WWW.NOACA.ORG

NOACA
Northeast Ohio Areawide Coordinating Agency
1299 Superior Avenue
Cleveland, Ohio 44114

Land Use Guidelines for Transit Supportive Development

Planning for Commuter Rail Station Area Development in Northern Ohio Communities

Vacant and abandoned land surrounding existing rail lines.

Station area development can bring new life to a previously neglected industrial site.

DRAFT

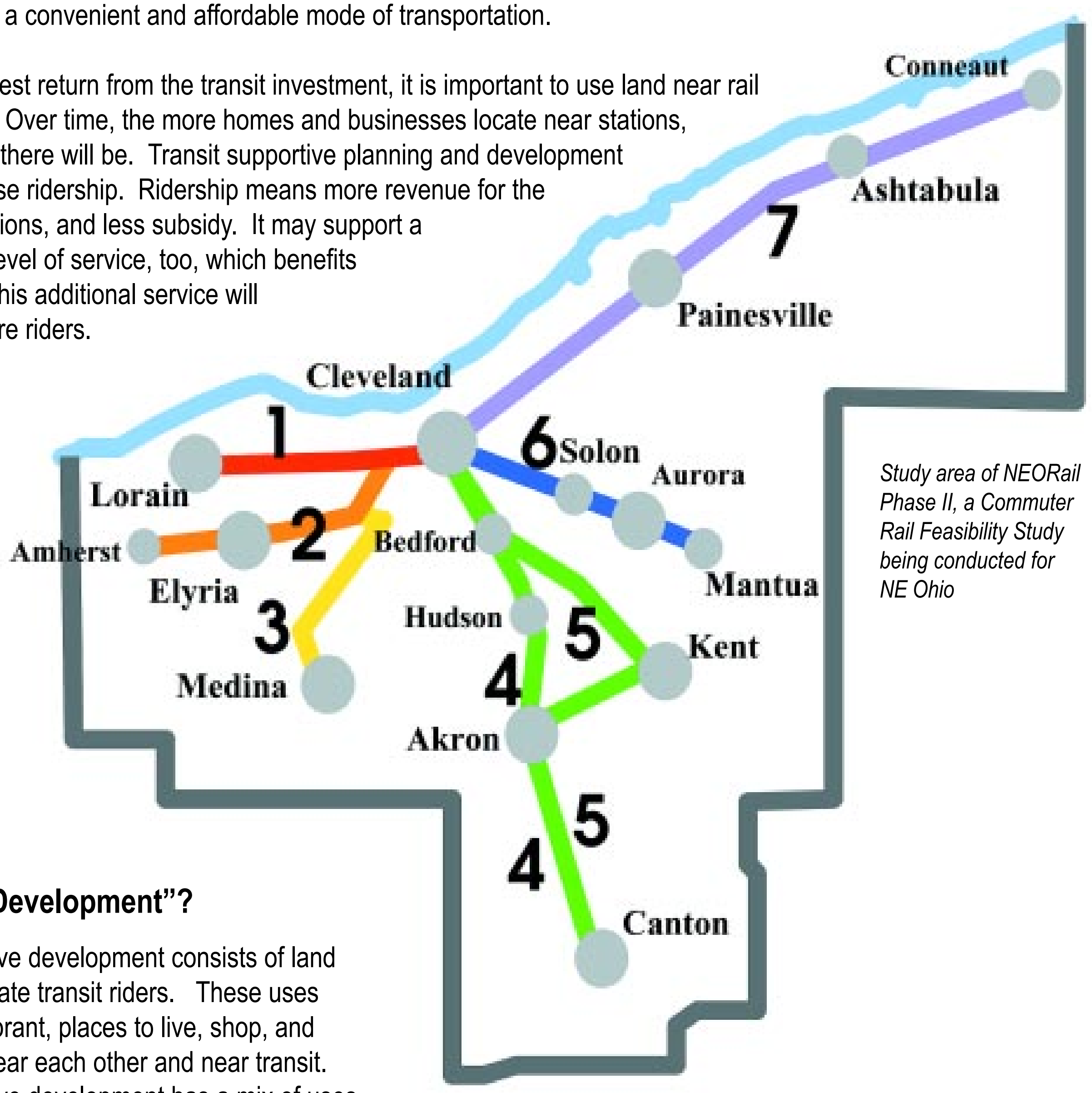
This brochure was developed in support of the
NEORail Phase II Project for the
Northeast Ohio Areawide Coordinating Agency (NOACA).
For more information, contact us at www.noaca.org.

NOACA
June 2001

Why Land Use Planning and Commuter Rail?

There are many reasons to invest in commuter rail… It provides people with a new transportation alternative to using the automobile, thereby reducing traffic congestion and air pollution. It lessens the need for investing in new roads. And it is a convenient and affordable mode of transportation.

To get the greatest return from the transit investment, it is important to use land near rail stations wisely. Over time, the more homes and businesses locate near stations, the more riders there will be. Transit supportive planning and development can help increase ridership. Ridership means more revenue for the system's operations, and less subsidy. It may support a more frequent level of service, too, which benefits everyone; and this additional service will attract even more riders.



Study area of NEORail Phase II, a Commuter Rail Feasibility Study being conducted for NE Ohio

What is "Transit Supportive Development"?

Transit supportive development consists of land uses that generate transit riders. These uses include safe, vibrant, places to live, shop, and work, located near each other and near transit. Transit supportive development has a mix of uses and activities (homes, jobs, public spaces and transportation) and a diverse range of housing types that offers a transit and pedestrian-friendly environment.

How Can You Use These Guidelines?

You can use these land use guidelines to help your community realize commuter rail's potential as an organizing principle for land use at station areas. These guidelines are advisory; the pages that follow contain planning and design concepts that can shape public and private development to be more transit-oriented and pedestrian-friendly. These guidelines can be applied to small and large-scale development, redevelopment, and changes in the design of streets, sidewalks, buildings and parks.

Land Use Planning: Everybody Wins!

The success of a commuter rail system depends on the number of people riding the train. Effective land use planning can encourage the development of land uses that generate and attract riders. In addition to just providing riders for commuter rail, these uses of land—offices, shops, and homes—can make the neighborhoods in which they are located more attractive, diverse, and interesting places to live, work and visit.

Photo courtesy of PBQD

Photo courtesy of PBQD

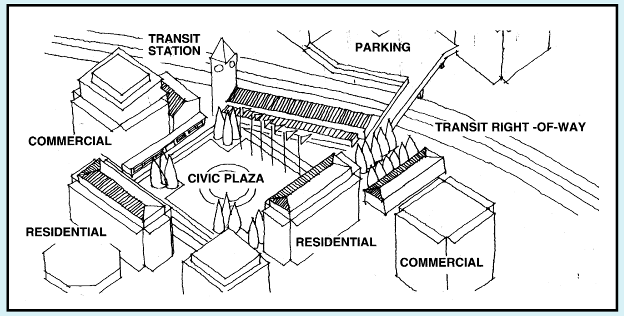
While the primary objective of transit supportive development is to increase the number of people using transit, other benefits include:

- Less need for highway investments,
- Enhanced property values and tax revenues,
- Reduction in automobile dependence,
- Increased access to transportation,
- Neighborhood revitalization, and
- An identifiable sense of community and improved quality of life.

BASIC PRINCIPLES

There are three broad principles to transit supportive development and design:

- **Provide for a Diversity of Land Uses.** These include housing, retail, office and commercial employment, recreation/entertainment and public spaces.
- **Create Compact Development.** By compact we mean development that makes full and efficient use of valuable land. Development should be within a five to ten minute walk of a transit station.
- **Design for pedestrians.** For transit to work, the pedestrian environment must also work. Streets, and open spaces should be safe and friendly to pedestrians. Attractive streets and buildings make people feel comfortable walking.



Open space can become a focus of the station area, improving the transit experience as well as the community itself.

Courtesy of "Planning for Transit-Friendly Land Use", by New Jersey Transit

What are the Key Features of Transit Supportive Land Use

Photo courtesy of PBQD

Photo courtesy of PBQD

Photo courtesy of PBQD

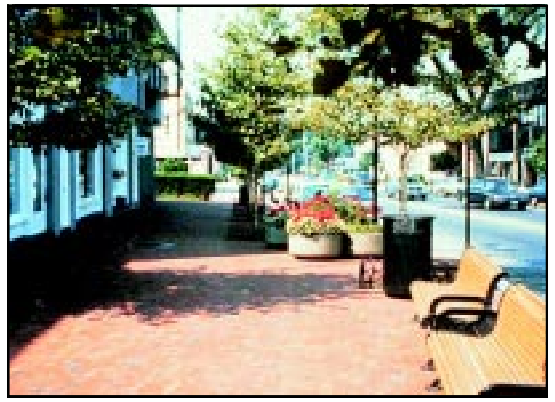


Photo courtesy of PBQD

Residential Design

- Promote a variety of housing types. This includes higher density residential development. A mix of development makes it easier for more people to choose to live near transit.
- Build streets that promote walking and bicycle mobility.
- Provide connections to park and natural areas.

Commercial Design

- Build structures close to sidewalks to promote walking.
- Provide street furniture (benches, lamp posts, bike racks)
- Add sidewalks and planter strips
- Encourage a mix of uses including retail, office and residential, near one another to provide interest and variety.

Civic Design

- Locate public services and facilities near transit, to accommodate people who are transit dependent.
- Add green spaces, fountains, sculpture and other attractive features to make a

Transportation Design

- Provide a variety of transportation options
- Promote alternatives to the automobile
- Design transit stations and stops that are visible.
- Ensure that access to transit stations is along clear, direct and convenient routes.
- Provide awnings, shelters, benches, good lighting, and similar features.

What Might Some Typical Station Areas Look Like?

Many factors influence commuter rail station area development. These include local preferences (as expressed in plans and zoning), existing development, and real estate market conditions. Below we focus on three examples of potential station area development: 1) developed areas, 2) emerging communities, and 3) "greenfield" and underdeveloped areas.

The examples are illustrative; they may resemble existing places, but they do not represent any one place in particular. They represent areas approximately one half-mile square—about 60 acres in size. Actual development will vary in scope or scale, depending on the size of the community and the extent of the station's marke

1. Stations in Developed Areas

Site Characteristics

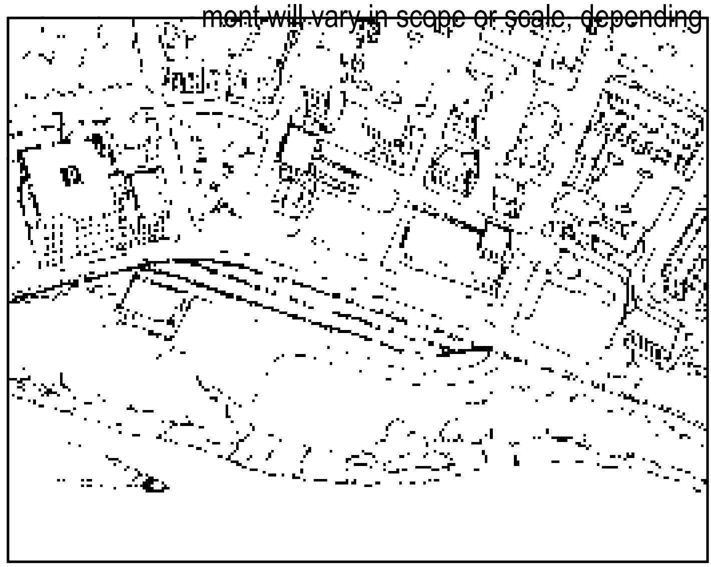
Many northeast Ohio communities were once served by rail. The stations may still be present, but they are usually neglected and vacant. The areas around the stations may be either residential or industrial, with some stores and other uses remaining. In some communities, the station areas are active; in others, the surrounding areas may be deteriorated or undervalued. Commuter rail investments may represent an opportunity to revitalize and re-use buildings and bring new life to older communities. These station areas are characterized by:

- Buildings typically over 50 years old
- Single family and two family homes, and apartments
- Locations in or near a downtown or CBD
- The need or the potential for redevelopment

Lorain, Ohio

Development Opportunities

- Mixed use commercial/office/retail development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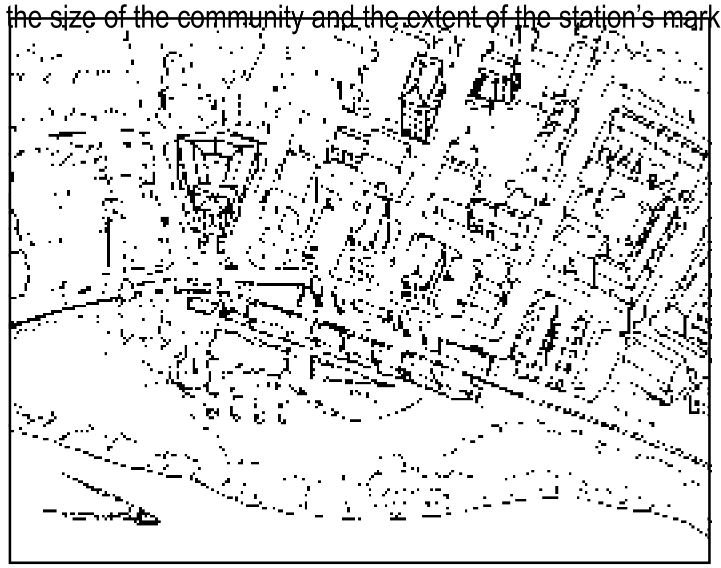

After

2. Stations in Developing Areas

Site Characteristics

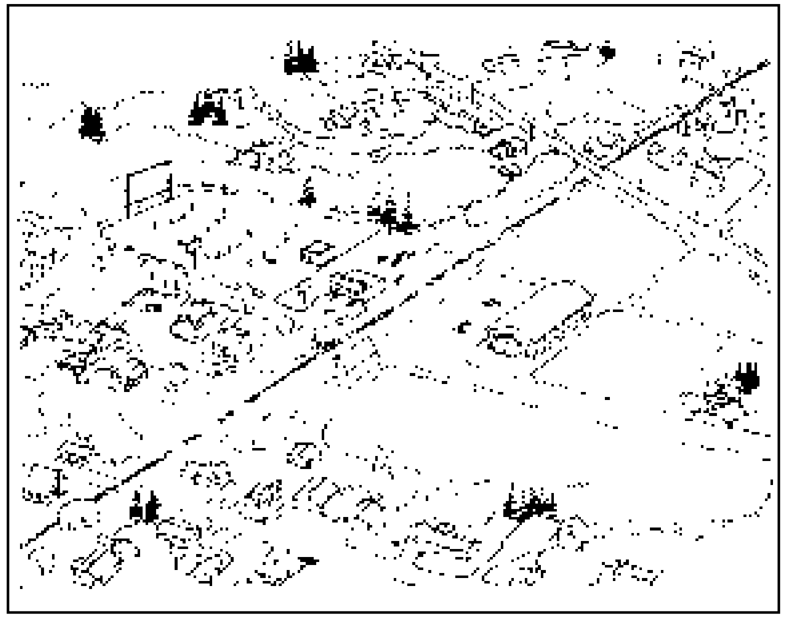
In many suburban communities and unincorporated areas, there are potential station areas where the process of urbanization has begun, but vacant land remains. Some development may be quite recent; other development may be several decades old. There is no pattern or focus to the development. Commuter rail service affords an opportunity to organize and plan the development. Such station areas are characterized by:

- A mix of land types and intensities
- Both recent and older developments
- Vacant sites and parcels of varying sizes both on main roads and newer side streets

Development Opportunities

- Commuter-oriented services adjacent to station
- Park-n-ride lot for commuters, with bus/kiss-n-ride facilities
- Mixed use commercial retail and office buildings

Mentor, Ohio



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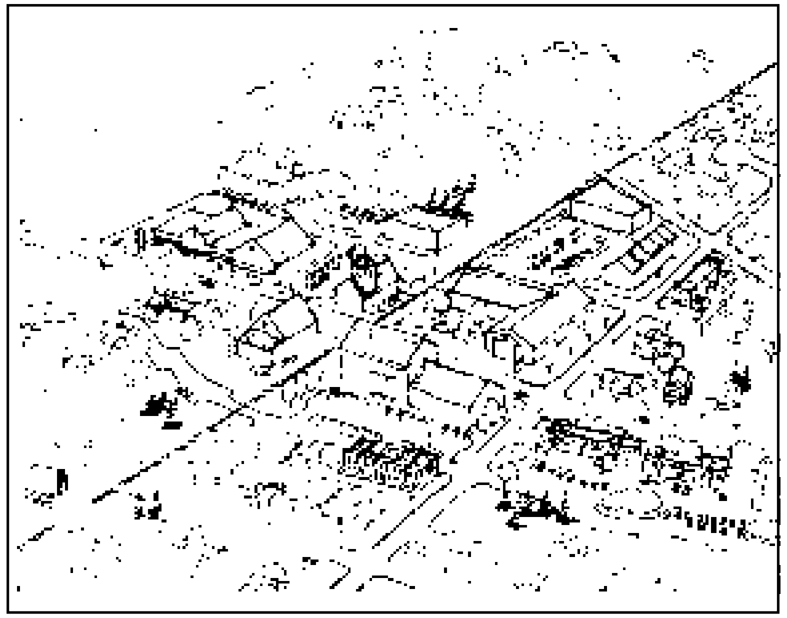

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3. Stations in "Greenfield" and Underdeveloped Ar-

Site Characteristics

"Greenfield" or underdeveloped sites are typically rural or exurban areas. Limited urban development has occurred there to date. There may be a few commercial buildings or older houses in the vicinity. These areas are characterized by:

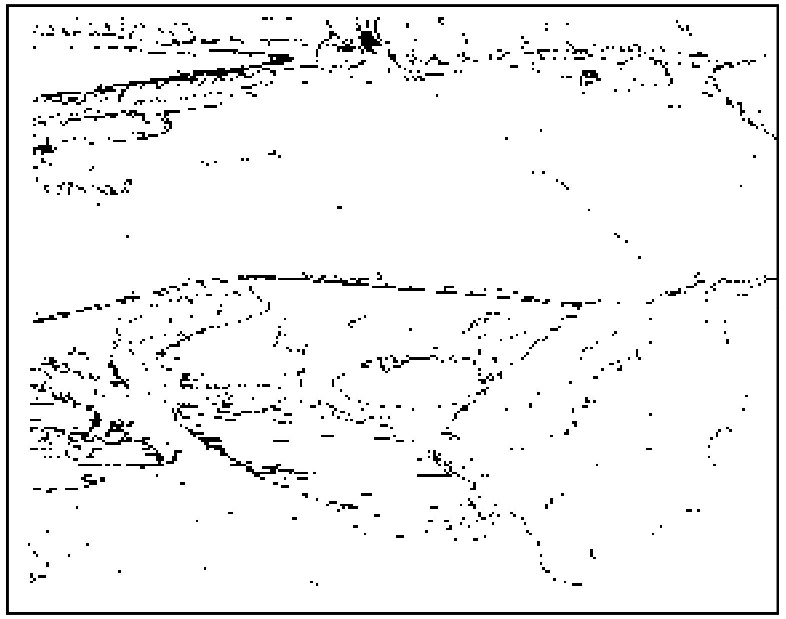
- Low density development surrounding the station site
- An abundance of vacant parcels

Development Opportunities

Opportunities could include a mix of commuter-oriented housing types and services adjacent to a station, with some short-term parking for midday access by nearby residents. Examples of commuter-oriented amenities that are desirabl in the immediate station area include:

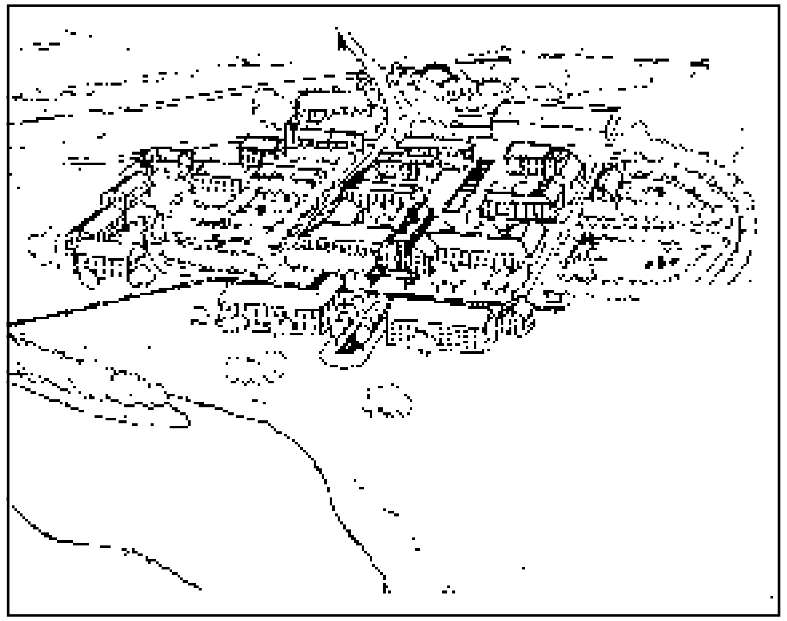
- Convenience-retail stores
- Dry-cleaning stores
- Day-care centers
- Banking/ATM facilities
- Barber shops/hair salons
- Newsstands
- Photo-finishing shops

SR83 - Avon Lake, OH



Before

Sketch plans adapted from "Rural By Design", by Randall Arendt



After

Appendix F:
Evaluation Criteria

EVALUATION MATRIX
NEORAIL PHASE I POTENTIAL COMMUTER RAIL ROUTES

	Lake West	West	South-West		South			East	Lake East	
	1	**2**	**3B**		**4D**	**4E**		**6**	**7**	

Land Use and Economic Development

Town Centers	4	3	1		14	11		3	6	
Growth	0.8	1.2	1.4		1.0	1.0		1.0	1.0	
Development/Redevelopment Potential	1.9	2.2	2.0		2.1	2.1		1.7	1.6	
Overall Relative Benefit	**Average**	**Marginally Higher**	**Marginally Higher**		**Marginally Higher**	**Marginally Higher**		**Marginally Lower**	**Marginally Lower**	

Welfare-to-Work

Low Income Households	High	Medium	Medium		High	Medium		High	Medium	
Feeder Bus Potential	5	5	6		8	9		6	5	
Rapid Transit Connections	1	2	2		1	1		1	0	
Destination Stations	2	3	2		4	4		3	5	
Overall Relative Benefit	**Average**	**Average**	**Lower**		**Average**	**Average**		**Average**	**Higher**	

Town Centers: Total number of Stations located within a town center

Growth: Stability index averaged over number of primary stations along route (0 = declining, 1 = stable, 2 = growing)

Development and Redevelopment Potential: Development / Redevelopment index averaged over number of primary stations along route (0 = uncertain, 1 = little available space, 2 = some available space, 3 = large amount of available space)

Low Income Households:

- High — More than 300 low income households per square mile
- Medium — 200 to 300 low income households per square mile
- Low — Fewer than 200 low income households per square mile

Feeder Bus Service: Total number of stations with good feeder bus potential

Rapid Transit Connections: Total number of stations with potential for rapid transit transfers

Destination Stations: Total no.of stations (outside City of Cleveland) with potential for reverse commute (i.e., >2,000 jobs within ½ mi. walk or >20,000 jobs within 2 miles of stations)

Sources: Information pertaining to low income households from *Corridor Profiles—Table 1.*
Information pertaining to town centers feeder bus, rapid transit, and destination stations from *Corridor Profiles—Table 3*.
Information pertaining to the stability index and development/redevelopment index from *Corridor Profiles—Table 4*.

EVALUATION MATRIX
NEORAIL PHASE I POTENTIAL COMMUTER RAIL ROUTES

Rail Freight Impact

	Lake West	West	South-West		South			East	Lake East	
	1	**2**	**3B**		**4D**	**4E**		**6**	**7**	
Existing daily trains (1995), Conrail—		48.4	48.4		13/26*	13/26*		12.5	53.4	
Norfolk Southern—	13.5								16	
CSX—										
Planned trains per day – Norfolk-Southern (post-merger)	16-37	33-57	33-57		30/30*	30/30*		30	35	
Planned trains per day – CSX (post-merger)	None	None	None		None	None		None	54	
Potential interference	Moderate	High	Low to Moderate		High	Moderate		Low	High	
Potential mitigation measures	Dbl. trk., west of Lakewood, CR Chi.Ln. interlckgs., Cuy. R. br.	Add'l. trk., Berea to Rockport, interl'ckgs, Cuy. R. br.	CR Chi.Ln. interlckgs., Cuy. R. br.		Add'l. trk., Hudson-Clev., CSX xing. at Akron, interl'ckgs	Add'l. trk., Bedford-Clev., interl'ckgs		Add'l. trk., Erie Xing.-Clev.	Add'l trk., Collinwood Yard area & east	
Bottlenecks:										
Cuyahoga River movable bridge	☑	☑	☑							
Berea/Hopkiins Airport		☑								
Collinwood Yard									☑	
Rockport Yard										
Motor Yard					☑					
Freight railroad support, for mixed passenger-freight operations	😐/☹***	☹	😐		☹	☺		😐	☹	
Overall Impact	**Limited**	**High**	**Limited**		**High**	**Limited**		**Low**	**High**	

* Conrail Cleveland Line: [trains between North Coast and Harvard / trains between Harvard and Hudson]

** For alternative alignment that passes through or adjacent to Rockport Yard.

*** Level of support depends upon future level of freight traffic (less support likely at higher levels of traffic).

EVALUATION MATRIX
NEORAIL PHASE I POTENTIAL COMMUTER RAIL ROUTES

	Lake West	West	South-West		South			East	Lake East	
	1	**2**	**3B**		**4D**	**4E**		**6**	**7**	

Grade Crossings

No. of grade crossings	59	28	8		65	98		19	56	
No. of higher-risk grade crossings (top 1,000 of 6,400) per ODOT ranking										
Rank 001 – 500 (most risky)	8	3	0		3	5		1	10	
Rank 500 – 1,000	4	9	3		1	0		1	8	
Relative Overall Impact	**Higher**	**Higher**	**Lower**		**Average**	**Average**		**Lower**	**Higher**	

Ease of Implementation

No. of freight railroads impacted	2	1	1		2	2		1	1	
Property acquisition	Minor	Minor	*Major*		Minor	Moderate		Minor	Minor	
Environmental process requirements	Major Investment Study and documentation of environmental effects required for any potential rail route.									
Overall ease of implementation	Good to Fair	Difficult	Difficult		Fair	Fair		Good	Fair	

EVALUATION MATRIX
NEORAIL PHASE I POTENTIAL COMMUTER RAIL ROUTES

	Lake West	West	South-West		South			East	Lake East	
	1	**2**	**3B**		**4D**	**4E**		**6**	**7**	

Travel Time Savings (AM peak line haul time to Cleveland central business district, in minutes]

	1	2	3B		4D	4E		6	7	
Location	Lorain	Elyria	Medina		Canton	Canton		Aurora	Conneaut	
AM Peak highway travel time	42	37	45		75	75		35	74	
Rail travel time	39	35	52		98	112		35	74	
Approx. line haul time savings	3	2	(7)		(23)	(37)		--	(1)	
Location					Akron	Akron			Painesville	
AM Peak highway travel time					50	50			34	
Rail travel time					56	70			34	
Approx. line haul time savings					(6)	(20)			--	
Relative Time Differential										
Short Trips to Cleveland	Average	Average	Average		Average	Average		Average	Average	
Long Trips to Cleveland	Average	Average	Average		Slower	Slowest		Average	Average	
Other Trips	Average	Average	Average		Average	Average		Average	Average	

EVALUATION MATRIX
NEORAIL PHASE I POTENTIAL COMMUTER RAIL ROUTES

	Lake West	West	South-West		South			East	Lake East	
	1	**2**	**3B**		**4D**	**4E**		**6**	**7**	
Congestion Relief										
Congested highway links benefitted										
I-77, Cleveland					☑	☑		☑		
I-71, Cleveland			☑							
I-77, Akron-Canton					☑	☑				
I-271/I-480, Cleveland					☑	☑		☑		
I-76, Akron										
SR-8, Akron					☑					
I-90/SR-2 West	☑	☑								
I-90/SR-2 East									☑	
Traffic Reduction (vehicles removed from peak load point cordon line)*										
Average Daily Traffic	1,610	1,970	1,590		830	780		770	1,980	
Peak Hour, Peak Direction Traffic	430	510	400		190	200		190	490	
Relative Benefit from Commuter Rail	**No significant difference among the alternatives; all would provide marginal benefits**									
Competitiveness of Commuter Rail with Highway Modes										
Travel to Cleveland CBD	Fair	Fair	Fair		Fair, Akron & North, Poor, S.of Akron	Fair, Kent & North, Poor, S.of Kent		Fair	Fair	
Travel to Akron/Canton CBDs	n.a.	n.a.	n.a.		Fair	Fair		n.a.	n.a.	

*Average auto occupancy rate of 1.3 persons per vehicle assumed. Cordon assumed to be at outer edge of Cleveland CBD, except for Route 9, which assumes cordon at Akron.

EVALUATION MATRIX
NEORAIL PHASE I POTENTIAL COMMUTER RAIL ROUTES

	Lake West	West	South-West		South			East	Lake East	
	1	**2**	**3B**		**4D**	**4E**		**6**	**7**	

Environmental Effects

Wetlands* (acres within ¼ mile buffer)										
Woods on hydric soils	760	468	171		669	995		111	1,959	
Open water	76	147	91		96	131		29	42	
Shallow marsh	22	50	8		140	275		55	544	
Shrub/scrub wetland	167	164	101		214	413		100	933	
Wet meadow	47	30	6		40	181		20	522	
Farmed wetland	3	13	0		5	22		0	22	
Rivers/streams (DLG)	39	28	57		51	44		28	6	
TOTAL	1,113	901	434		1,214	2,060		342	4,028	
Total per route-mile	44.9	27.3	11.3		19.5	29.5		13.7	59.9	
Overall Relative Impact	Higher	Average	Lower		Average	Average		Lower	Higher	
Stream Crossings										
River/Canal Crossings	2	6	–		8	10		–	3	
Stream/Creek Crossings	2	4	2		17	15		3	28	
Ditch Crossings	–	7	–		1	2		–	–	
TOTAL	4	17	2		26	27		3	31	
Total crossings per route-mile	0.16	0.52	0.05		0.42	0.39		0.12	0.46	
Overall Relative Impact	Lower	Higher	Lower		Average	Average		Lower	Average	

* Within ¼ mile buffer of rail alignment. Source for wetlands data: Ohio Wetlands Inventory, digital data base, Ohio Department of Natural Resources (satellite data).

EVALUATION MATRIX
NEORAIL PHASE I POTENTIAL COMMUTER RAIL ROUTES

	Lake West	West	South-West		South			East	Lake East	
	1	**2**	**3B**		**4D**	**4E**		**6**	**7**	

Environmental Effects (continued)

Endangered Species**										
State endangered					4	6		1	6	
State threatened					5	17		3	6	
State potentially threatened	1	1	1		27	84		6	12	
Plant community					1	12			4	
State champion tree										
State extirpated	1	1	1							
State special interest					1	1				
Animal colony	2	2	2					1		
Overall Relative Impact	Low	Low	Low		Potentially Significant	Potentially Significant		Low	Potentially Significant	
Air Quality – Svgs. in Vehicle-Miles Travelled (VMT) (for full network extent)										
Low	26,516	29,387	31,840		32,177	37,657		10,586	35,458	
High	60,957	61,974	74,636		57,740	70,526		19,042	90,275	
Regional Impact	Low	Low	Low		Low	Low		Low	Low	
Water Quality – Regional Impact	Low	Low	Low		Low	Low		Low	Low	

** Within ¼ mile buffer of rail alignment. Source for endangered species data: 4/98 National Heritage Data, Ohio Dept. of Natural Resources -Division of Natural Areas and Preserves

EVALUATION MATRIX
NEORAIL PHASE I POTENTIAL COMMUTER RAIL ROUTES

	Lake West	West	South-West		South			East	Lake East	
	1	**2**	**3B**		**4D**	**4E**		**6**	**7**	
Energy Consumption (Billions of BTUs per year]										
Rail consumption	5.1	7.8	9.5		19.4	21.8		5.2	14.0	
Equivalent autombile consumption	186.7	397.4	397.8		412.0	591.8		65.7	676.6	
Net savings	181.7	389.6	388.4		392.6	570.0		60.6	662.6	
Relative Benefit from Commuter Rail	**Below avg**	**Average**	**Average**		**Average**	**High**		**Low**	**High**	

Appendix G:
Ridership, Capital and O&M Cost back-up

1. **Ridership**
2. **Route Performance Statistics (Year 2025 estimates)**
3. **Cost-Effectiveness Data**

NeoRail II
Estimated Average Daily Ridership-- Year 2025
Capital Costs and Performance Measures

Route 1 -- Lorain

	Route 1 Lake West-Lorain Only		
	Lorain LOS 1	Lorain LOS 2	Lorain LOS 3
Cap Cost	$ 107	$ 174	$ 258
Ann Cap Cost	$8.06	$12.30	$18.35
Ridership			
Peak %	80%	92%	100%
Rev-Peak %	0%	50%	100%
Off-Peak %	0%	33%	100%
Daily Ridership	1,634	2,436	3,618
% of LOS 3	45.2%	67.3%	
Peak Period, Peak Direction	1,634	1,879	2,042
Peak Period, Reverse-Peak	-	109	218
Off-Peak	-	448	1,358
Total	1,634	2,436	3,618
HBW			1,789
HBO			1,132
Special Trip Generators			697
Total			3,618
Annualization factor	250	285	300
Annual Ridership (000s)	408.5	694.2	1,085.3

NeoRail II
Estimated Average Daily Ridership-- Year 2025
Capital Costs and Performance Measures

Route 2 -- Amherst

	Route 2 West- Elyria-Amherst Only				
	Elyria LOS 1	Elyria LOS 2	Elyria LOS 3	Amhst LOS 2	Amhst LOS 3
Cap Cost	$ 203	$ 376	$ 376	$ 410	$ 557
Ann Cap Cost	$15.08	$27.10	$27.10	$29.73	$35.15
Ridership					
Peak %	80%	92%	100%	90%	100%
Rev-Peak %	0%	50%	100%	50%	100%
Off-Peak %	0%	33%	100%	33%	100%
Pvl-Conn Peak %					
Daily Ridership	863	1,651	2,901	1,712	3,075
% of LOS 3	28.1%	53.7%	94.4%	55.7%	
Peak Period, Peak Direction				1,004	1,115
Peak Period, Reverse-Peak				180	360
Off-Peak				528	1,599
Total				1,712	3,075
HBW					1,127
HBO					670
Special Trip Generators					1,277
Total					3,075
Annualization factor	250	285	300	285	300
Annual Ridership (000s)	215.8	470.5	870.3	487.8	922.4

NeoRail II
Estimated Average Daily Ridership-- Year 2025
Capital Costs and Performance Measures

Route 3 -- Medina

	Route 3 SW-Medina Only via Rockport Medina LOS 1	Medina LOS 2	Medina LOS 3
Cap Cost	$ 231	$ 381	$ 394
Ann Cap Cost	$13.74	$23.93	$25.10
Ridership			
Peak %	80%	92%	100%
Rev-Peak %	0%	50%	100%
Off-Peak %	0%	33%	100%
Daily Ridership	632	1,359	2,540
% of LOS 3	24.9%	53.5%	
Peak Period, Peak Direction	632	727	791
Peak Period, Reverse-Peak	-	159	317
Off-Peak	-	473	1,432
Total	632	1,359	2,540
HBW			1,188
HBO			579
Special Trip Generators			774
Total			2,541
Annualization factor	250	285	300
Annual Ridership (000s)	158.1	387.2	762.1

NeoRail II
Estimated Average Daily Ridership-- Year 2025
Capital Costs and Performance Measures

Route 4D -- Canton-Akron-Cleveland via Hudson

	Route 4D South -- Canton-Akron-Cleveland Only via Hudson					
	Cuy.Fls. LOS 1	Cuy.Fls. LOS 2	Akron LOS 2	Akr-L2 Can-L1	Canton LOS 2	Canton LOS 3
Cap Cost	$ 188	$ 288	$ 364	$ 392	$ 430	$ 453
Ann Cap Cost	$13.95	$20.53	$26.42	$28.78	$31.91	$33.63
Ridership						
Peak %	80%	92%	92%	92%	92%	100%
Rev-Peak %	0%	50%	50%	50%	50%	100%
Off-Peak %	0%	33%	33%	33%	33%	100%
Can Pk %				80%		
Daily Ridership	1,039	1,654	2,108	2,842	3,371	5,598
% of LOS 3	18.6%	29.5%	37.7%	50.8%	60.2%	
Peak Period, Peak Direction					2,091	2,273
Peak Period, Reverse-Peak					536	1,072
Off-Peak					744	2,253
Total					3,371	5,598
HBW						2,762
HBO						1,474
Special Trip Generators						1,362
Total						5,598
Annualization factor	250	285	285	285	285	300
Annual Ridership (000s)	259.7	471.4	600.9	810.1	960.7	1,679.4

NeoRail II
Estimated Average Daily Ridership-- Year 2025
Capital Costs and Performance Measures

Route 4E -- Canton-Akron-Cleveland via Kent

	Route 4E South -- Canton-Akron-Cleveland Only via Kent					
	Kent LOS 1	Kent LOS 2	Akron LOS 2	Akr-L2 Can-L1	Canton LOS 2	Canton LOS 3
Cap Cost	$ 171	$ 246	$ 350	$ 378	$ 417	$ 439
Ann Cap Cost	$ 12.66	$ 17.51	$ 25.95	$ 28.31	$ 31.44	$ 33.16
Ridership						
Peak %	80%	92%	92%	92%	92%	100%
Rev-Peak %	0%	50%	50%	50%	50%	100%
Off-Peak %	0%	33%	33%	33%	33%	100%
Can Pk %				80%		
Daily Ridership	645	1,153	1,661	2,538	3,079	5,117
% of LOS 3	12.6%	22.5%	32.5%	49.6%	60.2%	
Peak Period, Peak Direction					1,932	2,100
Peak Period, Reverse-Peak					447	895
Off-Peak					700	2,122
Total					3,079	5,117
HBW						2,482
HBO						1,291
Special Trip Generators						1,344
Total						5,117
Annualization factor	250	285	285	285	285	300
Annual Ridership (000s)	161.3	328.5	473.3	723.3	877.6	1,535.0

NeoRail II
Estimated Average Daily Ridership-- Year 2025
Capital Costs and Performance Measures

Route 6 -- Aurora

	Route 6 East -- Solon-Aurora Only				
	Aurora LOS 1	Aurora LOS 2	Aurora LOS 3	Mantua LOS 2	Mantua LOS 3
Cap Cost	$ 128	$ 166	$ 166	$ 190	$ 190
Ann Cap Cost	$9.49	$11.44	$11.44	$13.45	$13.45
Ridership					
Peak %	80%	92%	100%	92%	100%
Rev-Peak %	0%	50%	100%	50%	100%
Off-Peak %	0%	33%	100%	33%	100%
Pvl-Conn Peak %					
Daily Ridership	1,411	2,411	3,943	2,458	4,017
% of LOS 3	35.1%	60.0%	98.2%	61.2%	
Peak Period, Peak Direction				1,657	1,802
Peak Period, Reverse-Peak				205	411
Off-Peak				596	1,805
Total				2,458	4,017
HBW					1,531
HBO					844
Special Trip Generators					1,642
Total					4,017
Annualization factor	250	285	300	285	300
Annual Ridership (000s)	352.7	687.1	1,182.9	700.6	1,205.1

NeoRail II
Estimated Average Daily Ridership-- Year 2025
Capital Costs and Performance Measures

Route 7 -- Lake/Ashtabula

Route 7
Lake East -- Lake-Ashtabula Only

	Mentor LOS 1	Mentor LOS 2	P'ville LOS 2	Pvl/Cn LOS 2	Mad/Cn LOS 2	Mad/Cn LOS 3	Mentor LOS 3	P'ville LOS 3	P'ville LOS 1
Cap Cost	$ 140	$ 173	$ 188	$ 193	$ 238	$ 246			
Ann Cap Cost	$10.43	$11.96	$13.21	$13.62	$17.29	$17.92			
Ridership									
Peak %	80%	92%	92%	92%	92%	100%	100%	100%	80%
Rev-Peak %	0%	50%	50%	50%	50%	100%	100%	100%	0%
Off-Peak %	0%	33%	33%	33%	33%	100%	100%	100%	0%
Pvl-Conn Peak %				80%					
Daily Ridership	931	1,568	1,727	1,858	1,960	3,259	2,549	2,846	1,007
% of LOS 3	28.6%	48.1%	53.0%	57.0%	60.1%		78.2%	87.3%	30.9%
Peak Period, Peak Direction					1,308	1,421			
Peak Period, Reverse-Peak					134	269			
Off-Peak					518	1,569			
Total					1,960	3,259			
HBW						1,644			
HBO						665			
Special Trip Generators						950			
Total						3,259			
Annualization factor	250	285	285	285	285	300	300	300	250
Annual Ridership (000s)	232.7	447.0	492.2	529.4	558.6	977.8	764.8	853.9	251.6

Master Project List

Costs in millions of 2000 dollars

	Total Project Cost *$m*	**Cost per Mile** *Rt.Mi.*	*$m/mi*	**Annualiz. Project Cost** *$k*	Total of all projects	**Route 1** **Lake West-Lorain Only**			**Route 2** **West- Elyria-Amherst Only**				**Route 3** **SW-Medina Only** via Rockport			**Route 4D** **South -- Canton-Akron-Cleveland Only** via Hudson						**Route 4E** **South -- Canton-Akron-Cleveland Only** via Kent						**Route 6** **East -- Auror**	
Route Terminus →						Lorain	Lorain	Lorain	Elyria	Elyria	Amhst	Amhst	Medina	Medina	Medina	Cuy.Fls.	Cuy.Fls.	Akron	Akr-L2	Canton	Canton	Kent	Kent	Akron	Akr-L2	Canton	Canton	uro	Mad/Cn
Territory / Projects Level of Service →						LOS 1	LOS 2	LOS 3	LOS 1	LOS 2	LOS 2	LOS 3	LOS 1	LOS 2	LOS 3	LOS 1	LOS 2	LOS 2	Can-L1	LOS 2	LOS 3	LOS 1	LOS 2	LOS 2	Can-L1	LOS 2	LOS 3	DS	LOS 3
GRAND TOTAL COST →					**$1,761**	**$107**	**$174**	**$258**	**$203**	**$376**	**$410**	**$557**	**$231**	**$381**	**$394**	**$185**	**$285**	**$361**	**$386**	**$424**	**$446**	**$166**	**$242**	**$345**	**$370**	**$409**	**$431**	**#**	**$246**
TOTAL ANNUALIZED CAPITAL COST →					**$118.4**	**$8.1**	**$12.3**	**$18.3**	**$15.1**	**$27.1**	**$29.7**	**$35.2**	**$13.7**	**$23.9**	**$25.1**	**$13.7**	**$20.3**	**$26.2**	**$28.3**	**$31.4**	**$33.1**	**$12.3**	**$17.2**	**$25.6**	**$27.7**	**$30.8**	**$32.5**	**#**	**$17.9**
CL. Downtown Cleveland	*Total*			*Total*	$167.5	$18.2	$77.4	$77.4	$18.2	$77.4	$77.4	$77.4	$18.2	$77.4	$77.4	$18.2	$43.9	$43.9	$43.9	$43.9	$46.3	$18.2	$43.9	$43.9	$43.9	$43.9	$46.3	#	$43.9
				Annualized	$7.6	$0.7	$4.3	$4.3	$0.7	$4.3	$4.3	$4.3	$0.7	$4.3	$4.3	$0.7	$1.7	$1.7	$1.7	$1.7	$1.7	$0.7	$1.7	$1.7	$1.7	$1.7	$1.7	#	$1.7
CL.1 Temporary Station, existing Amtrak site (initial service only)	$7.4			$90		1			1				1			1						1						1	
CL.2 NCTC Phase 1, 1-2 services, 1 island platform	$33.1			$1,088			1	1		1	1	1		1	1		1	1	1	1	1		1	1	1	1	1		1
CL.2a NCTC Phase 1, 3 services, 2 island platforms	$56.4			$1,886																									
CL.3 NCTC Phase 3, full development	$13.1			$659																									
CL.4 26th St. Yard/Shop Phase 1, initial service	$10.8			$613		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1		1	1
CL.5 26th St. Yard/Shop Phase 2, two services	$13.2			$613																	1						1		
CL.6 26th St. Yard/Shop Phase 3, full development	$0.0			$0																									
CL.7 Erie-Nickel Plate Connection	$33.5			$2,606			1	1		1	1	1		1	1														
EX. NCTC - Erie Xing	*Total*			*Total*	$64.9	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$27.6	$35.2	$35.2	$35.2	$35.2	$35.2	$27.6	$35.2	$35.2	$35.2	$35.2	$35.2	#	$0.0
				Annualized	$4.3	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$1.9	$2.5	$2.5	$2.5	$2.5	$2.5	$1.9	$2.5	$2.5	$2.5	$2.5	$2.5	#	$0.0
EX.1 3rd track, NCTC-Kinsman	$15.1	3.5	$4.29	$1,167												1	1	1	1	1	1	1	1	1	1	1	1	1	
EX.2 4th track, NCTC-Kinsman	$18.9	3.5	$5.38	$922																									
EX.3 3rd & 4th tracks, Kinsman-Erie Xing	$15.2	2.6	$5.85	$1,182												0.5	1	1	1	1	1	0.5	1	1	1	1	1	1	
EX.4 Kinsman-Union Phase 2, Aurora+Akron	$7.1			$576																									
EX.5 E.55th/Euclid Station	$4.9			$181												1	1	1	1	1	1	1	1	1	1	1	1	1	
EX.6 E.91st/Union Station	$3.7			$272																								1	
CY. Cuyahoga River Bridge, incl. Cleveland & Alcott approaches	*Total*			*Total*	$89.8	$9.2	$9.2	$80.6	$9.2	$89.8	$89.8	$80.6	$9.2	$89.8	$80.6	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	#	$0.0
				Annualized	$6.5	$0.7	$0.7	$5.8	$0.7	$6.5	$6.5	$5.8	$0.7	$6.5	$5.8	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	#	$0.0
CY.1 3rd track, bridge-to-Alcott	$9.2	2.3	$4.11	$714		1	1		1	1	1		1	1															
CY.2 New 2-track lift bridge & approaches -- 10 ft. rise	$80.6		n.a.	$5,779				1		1	1	1		1	1														
CY.3 New 2-track lift bridge & approaches -- 20 ft. rise	$0.0		n.a.	$0																									
HA. Alcott Jct. - Hopkins Airport	*Total*			*Total*	$265.6	$0.0	$0.0	$0.0	$56.7	$56.7	$56.7	$202.3	$14.3	$14.3	$27.3	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	#	$0.0
				Annualized	$13.2	$0.0	$0.0	$0.0	$3.9	$3.9	$3.9	$9.0	$1.1	$1.1	$2.1	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	#	$0.0
HA.1 Additional single track, Alcott-to-Puritas	$14.3	3.2	$4.47	$1,096					1	1	1		1	1															
HA.2 4-track mainline, Alcott-to-Puritas	$27.3	3.2	$8.52	$2,115								1			1														
HA.3 New single-track alignment past airport to Berea	$34.7	5.5	$6.31	$2,517					1	1	1																		
HA.4 New double-track alignment through airport	$118.4	2.9	$40.82	$3,465								1																	
HA.5 Grade-separated track connection, Airport-Berea	$36.0	2.5	$14.39	$2,611								1																	
HA.6 West Park Station	$6.7		n.a.	$256																									
HA.7 Hopkins Airport--Mainline side platform station	$7.6		n.a.	$241					1	1	1																		
HA.8 Hopkins Airport--Terminal Area Station	$20.7		n.a.	$852								1																	
	$57		n.a.																										
1. Alcott Jct. - Lorain	*Total*			*Total*	$59.6	$39.6	$47.5	$59.6	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	#	$0.0
				Annualized	$4.8	$3.2	$3.8	$4.8	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	#	$0.0
1.1 Alcott connection	$7.8		n.a.	$599		1	1	1																					
1.2 Track upgrade, NKP	$1.3	32.0	$0.04	$109		1	1	1																					
1.3 Grade crossing mitigation -- Lakewood	$9.7		n.a.	$788		1	1	1																					
1.4 Grade crossing upgrades -- Rocky River-Lorain	$4.2		n.a.	$339		1	1	1																					
1.5 Passing siding extension: Rocky River-Elmwood Rd.	$5.0	1.2	$4.14	$407			1	1																					
1.6 Passing siding extension: Avon	$2.9	0.5	$5.88	$238			1	1																					
1.7 Passing siding extension LOS 3: Lakewood-Rocky River	$1.7	0.6	$2.85	$137				1																					
1.8 Double-tracking, for LOS 3: Westlake-Avon	$10.4	4.7	$2.21	$841				1																					
1.9 Lorain Grove site connection	$2.8		n.a.	$231		1	1	1																					
1.10 Lorain Grove site terminal facilities	$2.8		n.a.	$230		1	1	1																					
Stations			n.a.																										
1.11 Lakewood Station	$1.0		n.a.	$79		1	1	1																					
1.12 Rocky River Station	$1.1		n.a.	$94		1	1	1																					
1.13 Westlake/Bay Village	$0.7		n.a.	$55		1	1	1																					
1.14 Avon	$2.6		n.a.	$215		1	1	1																					
1.15 Sheffield	$2.6		n.a.	$215		1	1	1																					
1.16 Lorain-Grove Site	$3.0		n.a.	$246		1	1	1																					

Master Project List

Costs in millions of 2000 dollars

	Total Project Cost *$m*	Cost per Mile *Rt.Mi.*	*$m/mi*	Annualiz. Project Cost *$k*	Total of all projects	**Route 1** **Lake West-Lorain Only**			**Route 2** **West- Elyria-Amherst Only**				**Route 3** **SW-Medina Only** via Rockport			**Route 4D** **South -- Canton-Akron-Cleveland Only** via Hudson						**Route 4E** **South -- Canton-Akron-Cleveland Only** via Kent						**Route 6** **East -- Auro**	
Route Terminus →						Lorain	Lorain	Lorain	Elyria	Elyria	Amhst	Amhst	Medina	Medina	Medina	Cuy.Fls.	Cuy.Fls.	Akron	Akr-L2	Canton	Canton	Kent	Kent	Akron	Akr-L2	Canton	Canton	uro	Mad/Cn
Territory / Projects Level of Service →						LOS 1	LOS 2	LOS 3	LOS 1	LOS 2	LOS 2	LOS 3	LOS 1	LOS 2	LOS 3	LOS 1	LOS 2	LOS 2	Can-L1	LOS 2	LOS 3	LOS 1	LOS 2	LOS 2	Can-L1	LOS 2	LOS 3	DS	LOS 3
GRAND TOTAL COST →					**$1,761**	**$107**	**$174**	**$258**	**$203**	**$376**	**$410**	**$557**	**$231**	**$381**	**$394**	**$185**	**$285**	**$361**	**$386**	**$424**	**$446**	**$166**	**$242**	**$345**	**$370**	**$409**	**$431**	#	**$246**
TOTAL ANNUALIZED CAPITAL COST →					**$118.4**	**$8.1**	**$12.3**	**$18.3**	**$15.1**	**$27.1**	**$29.7**	**$35.2**	**$13.7**	**$23.9**	**$25.1**	**$13.7**	**$20.3**	**$26.2**	**$28.3**	**$31.4**	**$33.1**	**$12.3**	**$17.2**	**$25.6**	**$27.7**	**$30.8**	**$32.5**	#	**$17.9**
2. Hopkins Airport - Elyria - Amherst	*Total*			*Total*	$189.3	$0.0	$0.0	$0.0	$78.4	$112.1	$145.8	$146.9	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	#	$0.0
				Annualized	$15.2	$0.0	$0.0	$0.0	$6.4	$9.0	$11.6	$11.7	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	#	$0.0
2.1 Berea Jct. trackwork	$13.1		n.a.	$1,055					1	1	1	1																	
2.2 3rd track, Berea-to-Elyria (south side)	$32.5		n.a.	$2,611						1	1	1																	
2.2a 4th track, Berea-to-N.Ridgeville (north side)	$25.2		n.a.	$1,981						1	1	1																	
2.2b 3rd track, Airport-to-Elyria (north side)	$34.1		n.a.	$2,750					1																				
2.3 3rd track, Elyria-to-Amherst (south side)	$25.4		n.a.	$1,953							1	1																	
2.4 NS Replacement siding (north side): Olmsted Falls-N. Ridgeville	$10.0		n.a.	$792						1	1	1																	
2.4a Elyria passing siding	$4.6		n.a.	$364							1	1																	
2.5 Grade crossing upgrades	$5.9		n.a.	$479					1	1	1	1																	
2.6 Elyria terminal facilities	$4.0		n.a.	$331					1	1																			
2.7 Amherst terminal facilities	$4.3		n.a.	$350							1	1																	
Stations:																													
2.8 Berea island station	$5.4			$440								1																	
2.8 Berea north side station	$4.3			$352					1	1	1																		
2.9 Olmsted Falls	$3.6			$297					1	1	1	1																	
2.10 N. Ridgeville	$5.5			$457					1	1	1	1																	
2.11 Elyria	$7.9			$650					1	1	1	1																	
2.12 Amherst	$3.5			$294							1	1																	
3. Hopkins Airport - Medina	*Total*			*Total*	$159.2	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$149.0	$159.2	$159.2	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	#	$0.0
				Annualized	$8.6	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$7.8	$8.6	$8.6	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	#	$0.0
3.1 Brook Park-to-Turnpike, connection via Rockport	$91.3	11.4	$8.01	$3,153									1	1	1														
3.2 Brook Park-to-Turnpike, connection via I-71	$0.0	0.0	n.a.	$0																									
3.3 Brook Park-to-Turnpike, connection via Fairgrounds	$0.0	0.0	n.a.	$0																									
3.4 CSX, Turnpike to Medina	$31.2	18.2	$1.72	$2,462									1	1	1														
3.5 Passing siding: Strongsville	$5.3	1.5	$3.53	$424										1	1														
3.6 Passing siding: Lester	$4.8	1.2	$4.03	$386										1	1														
3.7 Grade crossing upgrades	$4.1		n.a.	$330									1	1	1														
3.8 Medina terminal facilities	$6.3		n.a.	$505									1	1	1														
Stations:																													
3.9 Parma/Brook Park	$2.4			$198									1	1	1														
3.10 Snow Road/Airport	$1.9			$158									1	1	1														
3.11 Middleburgh Hts.	$2.4			$198									1	1	1														
3.12 Fairgrounds/Berea	$2.6			$215									1	1	1														
3.13 Strongsville	$2.1			$175									1	1	1														
3.14 Brunswick	$1.9			$158									1	1	1														
3.15 Lester	$1.9			$158									1	1	1														
3.16 Medina	$0.9			$77									1	1	1														
4. Erie Xing-Bedford	*Total*			*Total*	$30.6	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$30.6	$30.6	$30.6	$30.6	$30.6	$30.6	$30.6	$30.6	$30.6	$30.6	$30.6	$30.6	#	$0.0
				Annualized	$2.3	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$2.3	$2.3	$2.3	$2.3	$2.3	$2.3	$2.3	$2.3	$2.3	$2.3	$2.3	$2.3	#	$0.0
4.1 Additional passenger track, Union/Harvard-to-Bedford	$20.3	6.3	$3.22	$1,616												1	1	1	1	1	1	1	1	1	1	1	1		
4.2 Wheeling relocation, Harvard-to-White	$5.3	0.9	$5.75	$266												1	1	1	1	1	1	1	1	1	1	1	1		
4.3 Grade crossing upgrades	$1.7			$136												1	1	1	1	1	1	1	1	1	1	1	1		
4.4 Garfield Hts. Station	$3.3			$279												1	1	1	1	1	1	1	1	1	1	1	1		
4D. Bedford - Hudson - Cuyahoga Falls	*Total*			*Total*	$152.4	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$68.4	$135.5	$145.0	$145.0	$145.0	$145.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	#	$0.0
				Annualized	$11.7	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$5.3	$10.3	$11.1	$11.1	$11.1	$11.1	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	#	$0.0
4D.1 3rd track, Bedford-to-Hudson	$76.2	10.3	$7.40	$5,730												0.5	1	1	1	1	1								
4D.1a Grade crossing upgrades, Bedford-Hudson	$1.2		n.a.	$100												1	1	1	1	1	1								
4D.2 Hudson flyover	$23.1	1.0	$23.13	$1,660													1	1	1	1	1								
4D.3 Hudson flat junction	$1.6		n.a.	$127												1													
4D.4 Passing siding: Walton Hills	$3.2	1.1	$2.90	$249													1	1	1	1	1								
4D.5 Upgrade track, Hudson-Cuyahoga Falls	$13.4	7.7	$1.74	$1,088												1	1	1	1	1	1								
4D.6 Grade crossing upgrades, Hudson-Cuyahoga Falls	$3.2		n.a.	$257												1	1	1	1	1	1								
4D.7a Passing siding: Rebuild NS Hudson siding east of interlocking	$1.8	1.0	$1.81	$141													1	1	1	1	1								
4D.7 Passing siding: Hudson-Darrowville	$2.5	0.5	$4.95	$200													1	1	1	1	1								
4D.8 Upgrade track, Cuyahoga Falls-Arlington	$7.0	4.0	$1.74	$565														1	1	1	1								
4D.8a Passing siding: Cuyahoga Falls	$3.6	1.5	$2.39	$291														1	1	1	1								
4D.9 Grade crossing upgrades, Cuyahoga Falls-Arlington	$0.7		n.a.	$59														1	1	1	1								
4D.10 Cuyahoga Falls terminal facilities	$1.8		n.a.	$147												1	1												
Stations	$0.0		n.a.	$0																									
4D.11 Bedford-Grace St.	$1.0		n.a.	$92												1	1	1	1	1	1								
4D.12 Walton Hills	$2.9		n.a.	$239																									
4D.13 Macedonia	$4.8		n.a.	$391												1	1	1	1	1	1								
4D.14 Hudson	$1.6		n.a.	$136												1	1	1	1	1	1								
4D.15 Silver Lake	$1.1		n.a.	$97																									
4D.16 Cuyahoga Falls	$1.6		n.a.	$136												1	1	1	1	1	1								

Master Project List

Costs in millions of 2000 dollars

Territory / Projects	Total Project Cost $m	Cost per Mile Rt.Mi.	$m/mi	Annualiz. Project Cost $k	Total of all projects	Route 1 Lake West-Lorain Only			Route 2 West- Elyria-Amherst Only				Route 3 SW-Medina Only via Rockport			Route 4D South -- Canton-Akron-Cleveland Only via Hudson						Route 4E South -- Canton-Akron-Cleveland Only via Kent						Route 6 East -- Auror	
Route Terminus →						Lorain	Lorain	Lorain	Elyria	Elyria	Amhst	Amhst	Medina	Medina	Medina	Cuy.Fls.	Cuy.Fls.	Akron	Akr-L2	Canton	Canton	Kent	Kent	Akron	Akr-L2	Canton	Canton	uro	Mad/Cn
Level of Service →						LOS 1	LOS 2	LOS 3	LOS 1	LOS 2	LOS 2	LOS 3	LOS 1	LOS 2	LOS 3	LOS 1	LOS 2	LOS 2	Can-L1	LOS 2	LOS 3	LOS 1	LOS 2	LOS 2	Can-L1	LOS 2	LOS 3	DS	LOS 3
GRAND TOTAL COST →					**$1,761**	**$107**	**$174**	**$258**	**$203**	**$376**	**$410**	**$557**	**$231**	**$381**	**$394**	**$185**	**$285**	**$361**	**$386**	**$424**	**$446**	**$166**	**$242**	**$345**	**$370**	**$409**	**$431**	#	**$246**
TOTAL ANNUALIZED CAPITAL COST →					**$118.4**	**$8.1**	**$12.3**	**$18.3**	**$15.1**	**$27.1**	**$29.7**	**$35.2**	**$13.7**	**$23.9**	**$25.1**	**$13.7**	**$20.3**	**$26.2**	**$28.3**	**$31.4**	**$33.1**	**$12.3**	**$17.2**	**$25.6**	**$27.7**	**$30.8**	**$32.5**	#	**$17.9**
4E. Bedford - Kent/Akron	*Total*			*Total*	$145.6	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$49.7	$91.8	$137.6	$137.6	$137.6	$137.6	#	$0.0
				Annualized	$11.5	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$3.9	$7.2	$10.9	$10.9	$10.9	$10.9	#	$0.0
4E.1 Upgrade W&LE, Bedford-Kent	$61.0	23.0	$2.65	$4,749																		0.5	1	1	1	1	1		
4E.2 Passing siding extension: Glenwillow	$4.2	0.7	$6.03	$326																			1	1	1	1	1		
4E.2a Passing siding: Streetsboro	$7.4	1.5	$4.92	$558																			1	1	1	1	1		
4E.3 Grade crossing upgrades, W&LE	$6.8		n.a.	$552																		1	1	1	1	1	1		
4E.4 Kent terminal facilities	$5.5		n.a.	$435																		1	1						
4E.5 Upgrade Plum Jct. connection	$7.3		n.a.	$585																				1	1	1	1		
4E.6 Upgrade former Erie ROW, Kent-Arlington	$27.3	8.9	$3.06	$2,210																				1	1	1	1		
4E.6a Passing siding: Tallmadge	$7.8	1.5	$5.20	$619																				1	1	1	1		
4E.7 Grade crossing upgrades, PASC	$7.5		n.a.	$608																				1	1	1	1		
Stations	$0.0		n.a.	$0																									
4E.8 Glenwillow	$2.6		n.a.	$215																									
4E.9 Twinsburg	$2.8		n.a.	$237																		1	1	1	1	1	1		
4E.10 Streetsboro	$2.4		n.a.	$198																		1	1	1	1	1	1		
4E.11 Kent	$1.6		n.a.	$136																		1	1	1	1	1	1		
4E.12 Tallmadge	$1.4		n.a.	$119																				1	1	1	1		
A1. Akron Quaker Sq. via Arlington Flyover	*Total*			*Total*	$60.5	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$55.8	$60.5	$60.5	$60.5	$0.0	$0.0	$38.2	$42.9	$42.9	$42.9	#	$0.0
				Annualized	$4.6	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$4.3	$4.6	$4.6	$4.6	$0.0	$0.0	$3.0	$3.4	$3.4	$3.4	#	$0.0
A1.1 Arlington flyover, single track	$17.6	1.2	$14.64	$1,246														1	1	1	1								
A1.2 4-track line, Arlington-Akron	$25.1	3.4	$7.39	$1,994														1	1	1	1			1	1	1	1		
A1.3 Canton connection (existing embankment)	$4.7	0.8	$5.91	$377															1	1	1				1	1	1		
A1.4 Akron terminal facilities -- Quaker Square	$7.3		n.a.	$578														1	1	1	1			1	1	1	1		
A1.5 Akron Station -- Quaker Square	$5.8		n.a.	$446														1	1	1	1			1	1	1	1		
AC. Akron - Canton	*Total*			*Total*	$42.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$10.2	$38.4	$38.4	$0.0	$0.0	$0.0	$10.2	$38.4	$38.4	#	$0.0
				Annualized	$3.4	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.8	$3.1	$3.1	$0.0	$0.0	$0.0	$0.8	$3.1	$3.1	#	$0.0
1 Track upgrade	$0.0		n.a.	$0																									
2 Additional track upgrade	$8.7	15.0	$0.58	$707																1	1					1	1		
3 Grade crossing upgrades	$2.7		n.a.	$222															1	1	1				1	1	1		
4 Passing siding: Triplett	$3.6	1.0	$3.57	$283																1	1					1	1		
5 Passing siding: North Canton	$3.6	1.0	$3.57	$283																1	1					1	1		
6 Signals (ABS)	$12.3	22.2	$0.56	$998																1	1					1	1		
7 Canton terminal facilities	$3.3		n.a.	$263															1	1	1				1	1	1		
Stations:	$0.0		n.a.	$0																									
8 Triplett	$1.6		n.a.	$136																									
9 Myersville	$1.4		n.a.	$119																									
10 Akron-Canton Airport	$0.9		n.a.	$77															1	1	1				1	1	1		
11 N. Canton	$1.1		n.a.	$94															1	1	1				1	1	1		
12 Football Hall of Fame	$0.5		n.a.	$38																									
13 Canton-Tuscarawas	$2.1		n.a.	$175															1	1	1				1	1	1		
6. Erie Xing - Aurora - Mantua	*Total*			*Total*	$62.4	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	#	$0.0
				Annualized	$5.1	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	#	$0.0
6.1 Track upgrade, Union to Aurora	$11.3		n.a.	$918																								1	
6.2 New track, Aurora to Mantua	$6.5		n.a.	$523																									
6.3 Grade crossing upgrades, Union to Aurora	$2.6		n.a.	$214																								1	
6.3a Grade crossings (new), Aurora to Mantua	$2.0		n.a.	$161																									
6.4 Signaling and CTC	$12.8		n.a.	$1,034																								1	
6.5 Passing siding -- Solon	$4.4		n.a.	$357																									
6.6 Overnight storage facility -- Aurora	$3.7		n.a.	$298																								1	
6.7 Passing siding -- Aurora	$3.6		n.a.	$291																									
6.8 Overnight storage facility -- Mantua	$4.2		n.a.	$336																									
6.9 Stations	$0.0		n.a.	$0																									
10 E.131st/Miles	$0.5		n.a.	$40																								1	
11 North Randall/Bedford Hts.	$1.4		n.a.	$119																								1	
12 Harper Road	$2.6		n.a.	$215																								1	
13 Solon	$2.6		n.a.	$215																								1	
14 Geauga Lake (Six Flags)	$0.5		n.a.	$38																								1	
15 Sea World	$0.8		n.a.	$68																								1	
16 Aurora	$1.4		n.a.	$119																								1	
17 Mantua	$1.6		n.a.	$136																									

Master Project List

Costs in millions of 2000 dollars

Territory / Projects	**Total Project Cost** *$m*	**Cost per Mile** *Rt.Mi.*	*$m/mi*	**Annualiz. Project Cost** *$k*	Total of all projects	**Route 1** **Lake West-Lorain Only**			**Route 2** **West- Elyria-Amherst Only**				**Route 3** **SW-Medina Only** via Rockport			**Route 4D** **South -- Canton-Akron-Cleveland Only** via Hudson						**Route 4E** **South -- Canton-Akron-Cleveland Only** via Kent						**Route 6** **East -- Auror**	
Route Terminus →						Lorain	Lorain	Lorain	Elyria	Elyria	Amhst	Amhst	Medina	Medina	Medina	Cuy.Fls.	Cuy.Fls.	Akron	Akr-L2	Canton	Canton	Kent	Kent	Akron	Akr-L2	Canton	Canton	uro	Mad/Cn
Level of Service →						LOS 1	LOS 2	LOS 3	LOS 1	LOS 2	LOS 2	LOS 3	LOS 1	LOS 2	LOS 3	LOS 1	LOS 2	LOS 2	Can-L1	LOS 2	LOS 3	LOS 1	LOS 2	LOS 2	Can-L1	LOS 2	LOS 3	DS	LOS 3
GRAND TOTAL COST →					**$1,761**	**$107**	**$174**	**$258**	**$203**	**$376**	**$410**	**$557**	**$231**	**$381**	**$394**	**$185**	**$285**	**$361**	**$386**	**$424**	**$446**	**$166**	**$242**	**$345**	**$370**	**$409**	**$431**	**#**	**$246**
TOTAL ANNUALIZED CAPITAL COST →					**$118.4**	**$8.1**	**$12.3**	**$18.3**	**$15.1**	**$27.1**	**$29.7**	**$35.2**	**$13.7**	**$23.9**	**$25.1**	**$13.7**	**$20.3**	**$26.2**	**$28.3**	**$31.4**	**$33.1**	**$12.3**	**$17.2**	**$25.6**	**$27.7**	**$30.8**	**$32.5**	**#**	**$17.9**
7. NCTC - Painesville - Conneaut	*Total*			*Total*	$151.7	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	#	$151.7
				Annualized	$11.9	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	#	$11.9
7.1 Track upgrade, NCTC-Collinwood	$0.5	6.0	$0.08	$41																									1
7.2 Track upgrade, Collinwood-Painesville	$2.2	26.2	$0.08	$178																									1
7.3 Track upgrade, Painesville-Madison	$0.5	6.2	$0.08	$42																									1
7.4 Track upgrade, Madison-Conneaut	$2.4	28.3	$0.08	$192																									1
7.4a CSX Replacement Storage Tracks, w. of Collinwood	$5.1	2.8	$1.81	$416																									1
7.5 Collinwood Yard --3rd main track & interlocking reconfig.	$33.7	4.2	$8.03	$2,371																									1
7.6 New track -- Collinwood-Mentor	$26.4	11.8	$2.24	$2,117																									1
7.6a New track -- Mentor-Painesville	$10.1	5.9	$1.73	$817																									1
7.7 New track -- Painesville-Madison	$26.3	11.0	$2.39	$2,126																									1
7.8 Passing siding -- West End	$4.4	1.0	$4.42	$349																									1
7.9 Passing siding -- Willoughby-Mentor	$6.6	3.0	$2.19	$537																									1
10 Passing siding -- Painesville	$3.6	1.0	$3.57	$283																									1
11 Grade crossing upgrade--Collinwood-Mentor	$1.0		n.a.	$77																									1
11a Grade crossing upgrade--Mentor-Painesville	$1.9		n.a.	$154																									1
11b Grade crossing upgrade--Painesville-Madison	$3.5		n.a.	$283																									1
12 Overnight storage facility -- Madison	$2.5		n.a.	$206																									1
13 Overnight storage facility -- Conneaut	$2.6		n.a.	$212																									1
Stations	$0.0		n.a.	$0																									
14 E.Cleveland/Bratenahl	$1.4		n.a.	$118																									1
15 Euclid	$1.9		n.a.	$158																									1
16 West End	$2.4		n.a.	$199																									1
17 Willoughby	$2.4		n.a.	$199																									1
18 Mentor	$2.4		n.a.	$199																									1
19 West Painesville	$1.9		n.a.	$158																									1
20 Painesville	$1.4		n.a.	$118																									1
21 Madison	$0.9		n.a.	$77																									1
22 Geneva	$0.9		n.a.	$77																									1
23 West Ashtabula	$0.9		n.a.	$77																									1
24 Ashtabula	$0.7		n.a.	$55																									1
25 Conneaut	$0.9		n.a.	$77																									1
RS. Rolling Stock	*Total*			*Total*	$90.0	$40.0	$40.0	$40.0	$40.0	$40.0	$40.0	$50.0	$40.0	$40.0	$50.0	$40.0	$40.0	$50.0	$60.0	$70.0	$90.0	$40.0	$40.0	$60.0	$70.0	$80.0	$100.0	#	$50.0
				Annualized	$7.7	$3.4	$3.4	$3.4	$3.4	$3.4	$3.4	$4.3	$3.4	$3.4	$4.3	$3.4	$3.4	$4.3	$5.2	$6.0	$7.7	$3.4	$3.4	$5.2	$6.0	$6.9	$8.6	#	$4.3
RS1 Revenue Trainsets -- Lake West	$10.0			$860		3	3	3																					
RS2 Revenue Trainsets -- West	$10.0			$860					3	3	3	4																	
RS3 Revenue Trainsets -- Southwest	$10.0			$860									3	3	4														
RS4D Revenue Trainsets -- South-Hudson	$10.0			$860												3	3	4	4	4	5								
RS4E Revenue Trainsets -- South-Kent	$10.0			$860																		3	3	5	5	5	6		
RSAC Revenue Trainsets -- Akron-Canton	$10.0			$860															1	2	2				1	2	2		
RS6 Revenue Trainsets -- East	$10.0			$860																								3	
RS7 Revenue Trainsets -- Lake East	$10.0			$860																									4
Spare Trainsets	$10.0			$860		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	2	1	1

NEORAIL II
ROUTE PERFORMANCE STATISTICS
Year 2025 Estimates

	Daily Trips	Daily Passenger Miles	Daily Fare Revenue	Annual Fare Revenue 255 Days/Year	Annual Operating Cost 255 Days/Year	Annual Subsidy	Farebox Recovery Ratio
INDIVIDUAL ROUTES at LEVEL OF SERVICE 3							
1 Lorain	3,618	44,169	$ 7,235	$ 1,845,000	$ 8,541,000	$ 6,696,000	22%
2 Amherst	3,075	46,230	$ 6,148	$ 1,568,000	$ 7,949,000	$ 6,381,000	20%
3 Medina	2,541	41,869	$ 5,229	$ 1,333,000	$ 10,046,000	$ 8,713,000	13%
4 Canton (Hudson)	5,598	120,696	$ 14,792	$ 3,772,000	$ 15,637,000	$ 11,865,000	24%
5 Canton (Kent)	5,117	134,269	$ 13,738	$ 3,503,000	$ 17,930,000	$ 14,427,000	20%
6 Aurora-Mantua	4,017	66,337	$ 8,034	$ 2,049,000	$ 6,384,000	$ 4,335,000	32%
7 Conneaut	3,259	54,867	$ 6,730	$ 1,716,000	$ 10,348,000	$ 8,632,000	17%
TIER 1							
1 Lorain	2,557	46,560	$ 5,114	$ 1,304,000	$ 3,572,000	$ 2,268,000	37%
6 Aurora-Mantua	4,128	68,170	$ 8,256	$ 2,105,000	$ 3,551,000	$ 1,446,000	59%
General costs					$ 3,368,000		
TOTAL TIER 1	6,685	114,730	$ 13,370	$ 3,409,000	$ 10,491,000	$ 7,082,000	32%
TIER 2							
1 Lorain	2,758	49,063	$ 5,516	$ 1,407,000	$ 3,572,000	$ 2,165,000	39%
4 Canton (Hudson)	5,107	110,110	$ 13,494	$ 3,441,000	$ 11,481,000	$ 8,040,000	30%
6 Aurora-Mantua	3,218	53,143	$ 6,436	$ 1,641,000	$ 3,435,000	$ 1,794,000	48%
7 Conneaut	2,964	49,901	$ 6,121	$ 1,561,000	$ 6,999,000	$ 5,438,000	22%
General costs					$ 6,123,000		
TOTAL TIER 2	14,047	262,216	$ 31,567	$ 8,050,000	$ 31,610,000	$ 23,560,000	25%
TIER 3							
1 Lorain	3,631	45,215	$ 7,261	$ 1,852,000	$ 5,427,000	$ 3,575,000	34%
2 Amherst	2,620	39,388	$ 5,238	$ 1,336,000	$ 4,912,000	$ 3,576,000	27%
3 Medina	2,441	40,222	$ 5,023	$ 1,281,000	$ 6,736,000	$ 5,455,000	19%
4 Canton (Hudson)	4,341	93,593	11,470	$ 2,925,000	$ 11,415,000	$ 8,490,000	26%
5 Canton (Kent)	976	31,785	$ 2,676	$ 682,000	$ 2,945,000	$ 2,263,000	23%
6 Aurora-Mantua	2,601	42,954	$ 5,202	$ 1,327,000	$ 3,435,000	$ 2,108,000	39%
7 Conneaut	3,302	55,590	$ 6,819	$ 1,739,000	$ 6,999,000	$ 5,260,000	25%
General costs					$ 8,580,000		
TOTAL TIER 3	19,912	348,747	$ 43,690	$ 11,142,000	$ 50,449,000	$ 39,307,000	22%

Cost Effectiveness Data

	Route 1 Lake West-Lorain Only			Route 2 West- Elyria-Amherst Only				Route 3 SW-Medina Only via Rockport			Route 4D South -- Canton-Akron-Cleveland Only via Hudson					
Route Terminus →	Lorain	Lorain	Lorain	Elyria	Elyria	Amhst	Amhst	Medina	Medina	Medina	Cuy.Fls.	Cuy.Fls.	Akron	Akr-L2	Canton	Canton
Level of Service →	LOS 1	LOS 2	LOS 3	LOS 1	LOS 2	LOS 2	LOS 3	LOS 1	LOS 2	LOS 3	LOS 1	LOS 2	LOS 2	Can-L1	LOS 2	LOS 3
Effectiveness (Ridership)																
Daily Trips	**1,634**	**2,436**	**3,618**	**863**	**1,651**	**1,712**	**3,075**	**632**	**1,359**	**2,540**	**1,039**	**1,654**	**2,108**	**2,842**	**3,371**	**5,598**
Annualized Trips (000)	**408**	**694**	**1,085**	**216**	**470**	**488**	**922**	**158**	**387**	**762**	**260**	**471**	**601**	**810**	**961**	**1,679**
Costs (Millions of Year 2000 Dollars)																
Total Capital Cost	**$107**	**$174**	**$258**	**$203**	**$376**	**$410**	**$557**	**$231**	**$381**	**$394**	**$188**	**$288**	**$364**	**$392**	**$430**	**$453**
Total Annualized Capital Cost	**$8.1**	**$12.3**	**$18.3**	**$15.1**	**$27.1**	**$29.7**	**$35.2**	**$13.7**	**$23.9**	**$25.1**	**$13.9**	**$20.5**	**$26.4**	**$28.8**	**$31.9**	**$33.6**
Total O&M Costs (Annual)	**$5.8**	**$7.0**	**$8.9**	**$5.6**	**$6.4**	**$7.5**	**$9.5**	**$6.5**	**$7.8**	**$10.3**	**$6.3**	**$7.4**	**$8.3**	**$10.4**	**$11.8**	**$14.8**
Total Annual Cost (Capital and O&M)	**$13.9**	**$19.3**	**$27.2**	**$20.7**	**$33.5**	**$37.2**	**$44.6**	**$20.3**	**$31.7**	**$35.4**	**$20.2**	**$27.9**	**$34.7**	**$39.2**	**$43.7**	**$48.5**
Cost-Effectiveness																
Total Cost per Trip	**$34.06**	**$27.84**	**$25.08**	**$95.87**	**$71.35**	**$76.24**	**$48.43**	**$128.17**	**$81.92**	**$46.40**	**$77.77**	**$59.20**	**$57.81**	**$48.41**	**$45.43**	**$28.87**
Route Mileage	25 miles	25 miles	25 miles	26 miles	26 miles	32 miles	32 miles	35 miles	35 miles	35 miles	33 miles	33 miles	38 miles	38 miles	62 miles	62 miles
Total Capital Cost per Mile (millions)*	**$4.3**	**$7.0**	**$10.3**	**$7.8**	**$14.5**	**$12.8**	**$17.4**	**$6.6**	**$10.9**	**$11.3**	**$5.7**	**$8.7**	**$9.6**	**$10.3**	**$6.9**	**$7.3**
Capital Cost per Daily Trip (000)	**$65.5**	**$71.5**	**$71.2**	**$234.7**	**$227.8**	**$239.3**	**$181.2**	**$365.3**	**$280.2**	**$155.3**	**$180.7**	**$174.3**	**$172.4**	**$137.9**	**$127.6**	**$80.8**
O&M Cost per Route Mile (millions)	**$0.23**	**$0.28**	**$0.35**	**$0.22**	**$0.25**	**$0.23**	**$0.30**	**$0.19**	**$0.22**	**$0.29**	**$0.19**	**$0.22**	**$0.22**	**$0.27**	**$0.19**	**$0.24**

	Route 4E South -- Canton-Akron-Cleveland Only via Kent						Route 6 East -- Aurora Only					Route 7 Lake East -- Lake-Ashtabula Only					
Route Terminus →	Kent	Kent	Akron	Akr-L2	Canton	Canton	Aurora	Aurora	Mantua	Aurora	Mantua	Mentor	Mentor	P'ville	Pvl/Cn	Mad/Cn	Mad/Cn
Level of Service →	LOS 1	LOS 2	LOS 2	Can-L1	LOS 2	LOS 3	LOS 1	LOS 2	LOS 2	LOS 3	LOS 3	LOS 1	LOS 2	LOS 2	LOS 2	LOS 2	LOS 3
Effectiveness (Ridership)																	
Daily Trips	**645**	**1,153**	**1,661**	**2,538**	**3,079**	**5,117**	**1,411**	**2,411**	**2,458**	**3,943**	**4,017**	**931**	**1,568**	**1,727**	**1858**	**1,960**	**3,259**
Annualized Trips (000)	**161**	**328**	**473**	**723**	**878**	**1,535**	**353**	**687**	**701**	**1,183**	**1,205**	**233**	**447**	**492**	**529**	**559**	**978**
Costs (Millions of Year 2000 Dollars)																	
Total Capital Cost	**$171**	**$246**	**$350**	**$378**	**$417**	**$439**	**$128**	**$166**	**$190**	**$166**	**$190**	**$140**	**$173**	**$188**	**$193**	**$238**	**$246**
Total Annualized Capital Cost	**$12.7**	**$17.5**	**$26.0**	**$28.3**	**$31.4**	**$33.2**	**$9.5**	**$11.4**	**$13.4**	**$11.4**	**$13.4**	**$10.4**	**$12.0**	**$13.2**	**$13.6**	**$17.3**	**$17.9**
Total O&M Costs (Annual)	**$7.0**	**$7.5**	**$9.4**	**$11.4**	**$12.8**	**$16.7**	**$6.1**	**$7.1**	**$10.2**	**$7.1**	**$10.2**	**$5.6**	**$6.4**	**$7.1**	**$9.4**	**$10.1**	**$12.6**
Total Annual Cost (Capital and O&M)	**19.7**	**25.1**	**35.3**	**39.7**	**44.2**	**49.8**	**15.6**	**18.5**	**23.6**	**18.5**	**23.6**	**16.0**	**18.4**	**20.3**	**23.0**	**27.4**	**30.5**
Cost-Effectiveness																	
Total Cost per Trip	**$122.27**	**$76.37**	**$74.73**	**$54.97**	**$50.34**	**$32.47**	**$44.27**	**$26.96**	**$33.68**	**$15.66**	**$19.59**	**$68.76**	**$41.10**	**$41.28**	**$43.43**	**$49.07**	**$31.20**
Route Mileage	36 miles	36 miles	45 miles	45 miles	70 miles	70 miles	25 miles	25 miles	30 miles	25 miles	30 miles	22 miles	22 miles	28 miles	28 miles	67 miles	67 miles
Total Capital Cost per Mile (millions)*	**$4.7**	**$6.8**	**$7.8**	**$8.4**	**$6.0**	**$6.3**	**$5.1**	**$6.6**	**$6.3**	**$6.6**	**$6.3**	**$6.4**	**$7.8**	**$6.7**	**$6.9**	**$3.5**	**$3.7**
Capital Cost per Daily Trip (000)	**$264.4**	**$213.3**	**$210.7**	**$149.1**	**$135.3**	**$85.8**	**$90.6**	**$68.6**	**$77.2**	**$42.0**	**$47.2**	**$150.8**	**$110.1**	**$108.9**	**$103.8**	**$121.2**	**$75.3**
O&M Cost per Route Mile (millions)	**$0.20**	**$0.21**	**$0.21**	**$0.25**	**$0.18**	**$0.24**	**$0.25**	**$0.28**	**$0.34**	**$0.28**	**$0.34**	**$0.25**	**$0.29**	**$0.25**	**$0.33**	**$0.15**	**$0.19**

*Total Capital Cost divided by Total Route Miles

Appendix H:
Additional Funding Sources

ADDITIONAL FUNDING SOURCES

CAPITAL REVENUES

Federal Grant Programs

There are a number of federal grant programs[1] available to support the implementation of new rail lines: Section 5309 New Starts program, Section 5307 program, Congestion Mitigation and Air Quality Program (CMAQ) program, Surface Transportation Program (STP) funds, National Highway System (NHS) program, Interstate Maintenance program and the Section 130 Grade Crossing program.

Key Eligibility Requirements
Certain crosscutting requirements generally apply across all programs. To be eligible for funding, projects must be included in metropolitan and statewide plans and programs. Requirements of the National Environmental Policy Act must be met. Other crosscutting requirements relate to right-of-way acquisition, wage rates, access by people with disabilities, and competitive procurement. Programs administered by FTA require Project Management Plans, Section 13(c) certification (labor protection), and certain other certifications and assurances. For Section 5309 New Starts projects, FTA approval must be obtained at key project milestones (start of preliminary engineering and start of final design), and the project must be rated by FTA and authorized by Congress.

There are also program-specific eligibility requirements, including:

- *Section 5309 New Starts*. The FTA Fixed Guideway New Starts and Extensions Program provides the federal share of eligible new fixed guideway projects, in the form of either new systems or extensions to existing systems. New Starts projects may include bus rapid transit, commuter rail, heavy rail, light rail, and automated guideway transit systems. The funds are allocated in annual federal transportation appropriations law by earmarks. Project sponsors must address the FTA's New Starts Criteria and successfully compete for congressional earmarks in order to receive New Starts funding. Projects eligible for annual appropriations are generally authorized through federal transportation authorizing legislation. The current authorization law is the Transportation Equity Act for the 21st Century (TEA-21), within which New Starts fixed guideway projects authorized over the

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[1] FTA Notice of Proposed Rulemaking on the New Starts Criteria (April 7, 1999 Federal Register); FTA Circular C 9300.1, Capital Program: Grant Application Instructions; FTA Circular C 9030.1C, Urbanized Area Formula Program: Grant Application Instructions; FTA Notice of Availability of Funds and Solicitation for Job Access and Reverse Commute Grant Applications (November 6, 1998 Federal Register); and FHWA/FTA CMAQ Program Guidance (April 1999).

1998-2003 period are identified. Some of the projects authorized in TEA-21 have specific dollar earmarks, while others are identified by name with no dollar amounts attached.

- *Job Access and Reverse Commute Grants*. Requires regional job access and reverse commute transportation plans developed by a coordinated transportation/human services planning process. Grant award criteria include the percentage of the population that is welfare recipients, the need for additional services, coordination with State welfare agencies, and use of innovative approaches.
- *CMAQ Program*. Project sponsors must demonstrate that the project will lead to a reduction in air pollutant emissions. Priority is to be given to projects in a State Implementation Plan for air quality. Funds must generally be used for projects within the boundaries of a non-attainment or maintenance area. CMAQ may be used for operating assistance during the first three years of a new service.
- *National Highway System*. To be eligible for NHS funding, a transit project must serve the same corridor as a fully controlled access NHS highway, must improve the highway level of service, and must be more cost effective than a highway improvement.

Federal New Starts Criteria and Evaluation

To receive FTA approval to enter PE and final design, and to obtain an FTA project rating, project sponsors must address the FTA's New Starts Criteria:

- A project must be based on the results of alternatives analysis (or major investment study) and preliminary engineering. In alternatives analysis, a range of alternatives is considered in terms of costs, benefits, and impacts leading to the selection of a "locally preferred alternative". Alternatives analysis is part of the metropolitan planning process and may include preparation of a draft environmental document pursuant to the National Environmental Policy Act (NEPA). The alternatives analysis/major investment study phase is considered complete when a locally preferred alternative (LPA) is selected by local and regional decision-makers and adopted by the MPO (or MPOs, in the NEORail case) in the financially constrained metropolitan transportation plan(s). At this point, the local project sponsor(s) may submit to FTA the LPA's New Starts project justification and local financial commitment criteria and request FTA's approval to enter into the preliminary engineering phase of project development.
- A project must be justified. Five criteria are applied – mobility improvements, operating efficiencies, environmental benefits, cost effectiveness, and transit- supportive land use and future patterns.
- A project must be supported by an acceptable degree of local financial commitment. The local financial commitment criteria are intended to reflect the local funding proposed for the project, and the extent to which this funding is dedicated to the proposed investment. The local financial criteria are also intended to address the reasonableness of the project cost estimates and revenue forecasts; the adequacy of provisions to address unanticipated costs or funding shortfalls; the financial condition of the New Starts project sponsor(s); and how the sponsor(s) intend to ensure the operation and maintenance of existing transit services while implementing the proposed fixed guideway system. There are three financial criteria used by FTA to determine the Local Financial Commitment:

  - Proposed Non-Section 5309 New Starts share of project costs,
  - Stability and reliability of the capital financial plan, and
  - Stability and reliability of the operating financial plan.
- Projects must also successfully compete for congressional earmarks.

FTA assigns a rating of *high, medium-high, medium, low-medium, or low* to each of the project justification criteria and the local financial commitment criteria. These criteria/ratings are then combined into summary project justification and financial ratings. The summary ratings are then used to determine overall project ratings according to the following guidelines:

- *Highly Recommended* Projects must be rated at least medium-high for both finance and project justification.
- *Recommended* Projects must be rated at least medium for both finance and project justification.
- *Not Recommended* Projects not rated at least medium for both finance and project justification will be rated as Not Recommended.

Proposed Non-Section 5309 New Starts Share of Project Costs

By FTA standards, New Starts project capital costs are composed of two components: federal Section 5309 New Starts Funds and Non-Section 5309 New Starts funds. The Non-Section 5309 New Starts funds are the total of all local capital funds, including any state, county, private funds, and any federal funds other than New Starts funds. Other federal funds that can be counted toward the Non-Section 5309 New Starts match may include CMAQ program funds, STP funds, U.S. Department of Housing and Urban Development funds, and U.S. Environmental Protection Agency funds.

The Non-Section 5309 funds must include a local share, which by federal law is a minimum of 20 percent. Overmatches, i.e., local shares of more than 20 percent, are considered in the rating process, because they reduce FTA's overall financial burden to implement individual capital projects. Therefore, projects with overmatch leverage discretionary federal funds by demonstrating clear local commitment.

Stability and Reliability of the Capital Financing Plan

FTA assesses the stability and reliability of the sponsoring agency's (or agencies') capital financial plan by evaluating the capital financing assumptions for forecasting proposed local funds, and by examining the financial condition of all agencies or other entities that are committed to provide funds to the project. This measure assesses the strength of local capital financing plans as determined by:

- The financial capacity of the sponsoring agencies to build the proposed projects and adequately fund the capital maintenance of the existing transit system, including buses, once the New Starts project is complete,
- The stability and reliability of each proposed source of local funding including intergovernmental grants, tax sources, and debt obligations, with an emphasis on the availability of funding within the New Starts investment schedule for construction,

- The level of adequate provisions or contingencies to cover cost overruns or reduce federal or non-federal funding levels, and
- The financial capacity of the sponsoring agency to undertake other planned major transit investments within the region.

Stability and Reliability of the Operating Financing Plan

FTA assesses the stability and reliability of the operating agency's (or agencies') financial plan in order to determine the agencies' ability to operate and maintain the system once the proposed project is in revenue operation. FTA examines the extent to which the agency relies on local funding sources for the ongoing operation of its existing transit system, including buses, in addition to other committed capital investments for the forecast planning period. Sensitivity analysis is conducted to analyze the sensitivity of local financial projections to changes in ridership, operating costs, local economic conditions and other related issues in order to evaluate the operating revenue base, determine an agency’s capacity to expand funding to meet the incremental operating costs associated with the New Starts investment and any other committed services and facilities, and determine an agency's financial capacity to operate and maintain the New Starts project and the existing system, once the new project is completed.

Regional/Local Requirements

As mentioned above, FTA staff collects and reviews local information and documentation from the New Starts project sponsor(s) to assess the implementing agency(s) financial condition and local financial commitment. The key supporting document considered by FTA staff is the sponsoring agency’s fiscally constrained Long Range Plan (LRP). In order for the project to be eligible for New Starts funds, it is necessary to include the project in the fiscally constrained LRP.

When and How Successfully Applied

Many of the federal grant programs have been successfully applied to commuter rail and other fixed guideway transit programs. Frequently, they are applied in combination. Examples of recent commuter rail projects funded with Federal grants are shown below.

- *Tri-Rail System in South Florida*: Initial development of this system was funded as a traffic mitigation measure using Interstate Maintenance (4-R) funding. Subsequent service enhancements (double tracking, extension, added stations, equipment) have been funded with Section 5309 New Starts, Section 5309 Bus, and CMAQ/STP monies.
- *MARC System in Maryland*: Section 5309 New Starts for extensions and upgrades, including rolling stock procurement.
- *RAILTRAN in Dallas/Fort Worth*: Section 5309 New Starts (for phase II extension), Section 5307 Formula, CMAQ/STP.
- *Wisconsin Central Line in Chicago*: Section 5309 New Starts.

Schedule and Other Considerations

- *Section 5309 New Starts Program*. This program is very competitive, with a long list of projects in the pipeline. An alternatives analysis study must be completed. FTA rates proposed projects on an annual basis during the fall, based on project information submitted by project sponsors in the late summer (for FY 2001 the submittals were due

September 3, 1999). FTA's funding recommendations are submitted to Congress in February. Congressional earmarks determine funding allocations. On average, those projects receiving Section 5309 New Starts funds are obtaining 50% of the project's capital cost from this source.

- *Job Access and Reverse Commute Grants*. Applications must be submitted to FTA near the end of the calendar year.

Ohio Transportation Review Advisory Council (TRAC)

The Ohio General Assembly created the TRAC in 1997. The objective of the TRAC process is to provide an objective, quantitative process for selecting major new capacity-enhancing transportation projects for receipt of state discretionary funding.

For consideration for funding through the TRAC process projects must be more than $5 million in cost, and do one or more of the following: reduce congestion, increase mobility, provide connectivity, and/or increase a region's accessibility for economic development. To leverage TRAC investments, project sponsors are encouraged to seek alternate funding by tapping local funds, keeping project costs minimal, and using long-term local financing.

Evaluation Process

The TRAC selection process focuses primarily on highway projects. The evaluation measures used for project selection are highway-related, and include average daily traffic (ADT), volume to capacity ratio (V/C), roadway functional classification (FC), Accident Rate (AR), and other measures that do not apply directly to public transportation projects. For evaluation of transit projects, the TRAC uses parallel criteria to rank certain types of transit projects and to compare them to highway projects.

Policy 12 of the TRAC *Policies for Selecting Major New Capacity Projects* deals with fixed transit line evaluation. The policy provides surrogate criteria that can be used when a transit project has some similarities to a highway project, such as being a linear expansion to move people or freight in a given area.

For instance, the expansion or creation of a commuter rail line can be compared to a parallel highway expansion in that both are intended to alleviate congestion in the peak hour. However, the parallel criteria cannot be used for non-linear projects, such as a transit station.

The criteria used for evaluation of fixed transit lines are:

1. *Directional Peak Hours Transit Ridership* - This measure is considered by TRAC to be a surrogate for the volume/capacity ratio used for highway projects. Projects are assigned a point scale based on the number of peak hour transit riders. The number of points assigned range from a high of 40 points for ridership in excess of 3,630 passengers in the peak hour to a low of 0 points for ridership fewer than 240 passengers.
2. *Roadway Classification* - This measure is considered by TRAC to be a surrogate for congestion relief and optional mode available in a particular corridor. Projects are assigned points based on the type of roadway that the fixed transit line parallels. The

number of points assigned can be 5 for projects paralleling interstate highways and 2 for projects paralleling principal arterials.

3. *Accident Rate* - As with the other two criteria, a surrogate accident rate is assigned for either an interstate or a principal arterial. If a proposed fixed line transit project parallels either of these two types of facilities, it receives a score based on the average accident rate of the parallel facility.

In addition to the above criteria, TRAC also considers criteria under the categories of economic development, non-Ohio Department of Transportation (ODOT) participation and inter-modal connectivity in the evaluation of transit projects. Non-linear projects are considered by TRAC on a case-by-case basis.

Nominations

The TRAC's process of prioritizing projects begins with project nomination. The TRAC does not initiate projects, but rather reviews and ranks projects submitted to it.

Projects may be nominated by:

- The Ohio Department of Transportation
- Metropolitan planning organizations,
- County engineers,
- Transit authorities,
- County commissions,
- Municipalities, and
- Port authorities.

Transportation Scores

The ODOT Division of Multi-Modal Planning conducts technical analysis and scoring of proposed projects. Only projects that address TRAC's fixed line transit criteria are scored. The draft scores recommended by ODOT are provided to TRAC. Project advocates are provided opportunity to review and comment on the sufficiency and accuracy of ODOT's draft transportation scores. ODOT staff members meet with project sponsors and, upon request, review supplementary data provided by project sponsors. The supplementary data is used to consider whether attributes such as traffic volumes, levels of congestion and accident rates need to be revised based on the information presented by the project advocates. The ODOT staff may then recommend a revised score to the TRAC. If the project advocate disputes a score, ODOT staff informs TRAC members that a score has been appealed. The TRAC will make final decisions on what project scores should be.

Selection of Projects Without a Score

The ranking of TRAC projects provides a means by which the TRAC can prioritize and rank projects in order of their transportation and economic development benefits.

However, the TRAC process does not require a selected project to have a specific numeric ranking or that the TRAC must fund projects in rank order. TRAC policy allows projects to be selected regardless of their score or ranking. The reason is that no ranking system can completely measure all project attributes. If other factors arise that the TRAC finds important to a project, the TRAC can select the project for funding regardless of its score. This will happen most frequently with non-traditional projects.

Ohio Public Transportation Grant Program

The Ohio Public Transportation Grant Program[2] is a source of revenue for regional transit authorities, county transit boards, municipalities, or counties that own or operate public transportation systems. The program has three components - a formula component ($25.5 million), a discretionary capital component ($3.4 million) and a supplemental capital component ($9.0 million). Each component is described below.

- *Formula Funds*: ODOT employs a performance-based allocation strategy using three factors - ridership, revenue miles and local financial support - to distribute formula funds to individual public transportation systems. These funds may be used for any eligible operating, planning or capital project at the discretion of the individual systems. Maximum state participation is 50% of the non-federal share for operating projects, 10% of total costs for planning projects and up to 80% of total cost for capital projects. If a project is also receiving Section 5309 New Starts funds through a statewide earmark, public transportation grant participation is limited to 10% of project costs.
- *Discretionary Capital Funds:* These funds are awarded at the discretion of ODOT for major transit facilities such as transit centers, bus and rail terminals and passenger transfer facilities. ODOT evaluates each facility for funding based on its potential to improve mobility, provide greater accessibility and increase ridership. Maximum state participation for any eligible project is 50%.
- *Supplemental Capital Funds:* These funds are awarded at the discretion of ODOT for major capital improvement projects. Eligible projects include facilities, rolling stock and equipment. ODOT evaluates each project for funding based on its ranking as a local project priority and critical system need, implementation schedule and ability to leverage federal funds. Maximum state participation is 20%.

Each urbanized transit system receives an annual allocation that it may use toward any grant approved by the Federal Transit Administration. Eligible applicants must file an annual application that can include requests for operating, planning, and capital funding and must be based upon annual Program Criteria. A copy of the federal grant approval and budget must be included with the State application. Applicants in urbanized areas may apply for funding from the beginning of the state fiscal year through April 30 of the following year. It should be noted that operating assistance is limited to operating periods initiated on or after October 1, 1998 in urbanized areas under 200,000 in population.

All capital improvement projects except those advanced with formula funds are subject to ODOT’s Transit Capital Project Evaluation and Selection Process. The criteria for project selection is consistent with the goals of TEA-21 to preserve existing facilities and services while providing opportunities to enhance and expand those services beyond existing levels. Projects subject to grant applications are evaluated and scored using the following criteria:

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[2] As authorized under § 5501.07 of the Ohio Revised Code.

- *Passenger Boardings* – points are assigned based upon expected daily passenger boardings.
- *Mobility Impacts* – points are assigned based on how many of seven potential travel modes a project serves or provides (i.e., pedestrian and bicycle facilities, local bus and paratransit service, commuter and intercity bus, human services and private provider services, park-and-ride facilities, light and heavy rail, and commuter and intercity rail).
- *Socioeconomic Characteristics* – points are assigned by comparing the socioeconomic characteristics of an area directly served by a project against a statewide average.
- *Livable Communities* – points are assigned for new transit supportive development in, adjacent to or within one-quarter mile of a proposed project that can be directly attributable to the project.
- *Local Contribution and Participation Rate* – points are assigned according to the dollar amount of local funds contributed toward a project (local share) and the corresponding local participation rate. Local share includes all eligible non-FTA and non-ODOT funds.
- *Federal Enterprise Zone Designation* – points are awarded to projects located in and directly serving areas designated by the U.S. Department of Housing and Urban Development as Enterprise Zones.
- *Local Project Priority* – points in this category are reserved for projects that have been assigned a local priority by the MPO.
- *Benefit to Cost Ratio* – the benefit assigned to a project will be a point total equal to its cumulative score for the previous seven criteria. The benefit score will be divided by the cost of the project to determine the benefit to cost ratio, which will be expressed as a percentage. The project with the highest benefit/cost ratio will be assigned 10 points. Projects with the nine next highest ratios will receive nine through one point in descending order. No points will be awarded to any remaining projects.

Ohio Rail Development Commission

The Ohio General Assembly created the Ohio Rail Development Commission (ORDC) in 1994. ORDC's mission is "to plan, promote and implement the improved movement of goods and people faster and safer on a rail transportation network connecting Ohio to the nation and the world." The mission is to be accomplished through "a coordinated freight and passenger rail system, which is an integral part of a seamless, intermodal transportation network contributing to Ohio's quality of life and economic development."

The ORDC had a budget of $46.2 million for the fiscal 1998-99 biennium ending June 30, 1999. The State of Ohio contributed $14.2 million of the total. Most of that came from the ORDC’s 50% share of the Corporate Franchise Tax paid by the railroads. ORDC also received $30 million in federal funds, which was earmarked for grade crossing improvements. The Commission is scheduled to receive $520,000 in loan repayments for projects approved during the 1998 and 1999 fiscal years.

Through its grant and loan program, ORDC assists railroads and industries requiring rail service, city, county, village and township agencies, boards or commissions, regional transit boards and port authorities in helping to create new jobs and retain existing ones by rehabilitating existing lines, developing new ones, or through the purchase of other lines that will guarantee to businesses reliable and convenient access to markets.

The maximum grant or direct loan amount approved under the ORDC program is flexible. The maximum term for a loan is decided on a project-by-project basis; but, as a rule, loan terms are limited to five years. Take-out loans are also available, with funds distributed by ORDC upon completion of the project. Grants are reserved for cases where there is most need or where there is no direct revenue stream that can be used to retire the debt. In some instances, "need" may be defined as incentives necessary to ensure that a project is located in Ohio rather than another state. The ORDC may request any of the following items as collateral or security for funded rail projects.

- Pledge of identified tax revenues, fees tolls or other revenues available to support the project.
- Guarantees from borrowers or related entities.
- First mortgage or lien position of the assets financed.
- A letter of credit.

Besides facilitating economic development and improving passenger train service, ORDC's other main objective is to increase safety at rail grade crossings through the installation of warning lights and other safety devices. Rail safety programs focus on three main areas:

- The Corridor Improvements Program is intended to tackle a series of crossings on a line of track through a community and bring the power of Federal Dollars to improve the critically important crossings while closing redundant, under used or dangerous crossings.
- In cooperation with the Public Utilities Commission of Ohio and the railroad company, the ORDC installs or upgrades the active warning devices, such as railroad flasher lights and gates, at critical crossings.
- In an effort to induce the motoring public to pay particular attention to trains at crossings in lieu of picking their way through a rough crossing, the ORDC has instituted a trial program to repair or upgrade the grade crossing surface at a limited number of grade crossings throughout the state.

OPERATING REVENUES

Ohio Elderly and Disabled Transit Fare Assistance Program

The ODOT provides grant funds through the Ohio Elderly and Disabled (E&D) Transit Fare Assistance Program[3] to enable public transportation systems in Ohio to offer reduced fares to the elderly and people with disabilities. The Ohio Office of Public Transportation administers the program. Funding for public transportation systems in rural and small urban areas under 50,000 population is allocated by multiplying the actual number of elderly and disabled passengers by the amount of the reduced fare. Funding for urbanized areas over 50,000 population is allocated by formula to individual public transportation systems based on an estimate of elderly and disabled ridership as derived by multiplying actual system ridership by the ratio of elderly and disabled population to the general population within the transit service area. Since the E&D program is formula based and uses operating data provided by applicants in the determination of grant awards, ODOT will not accept an application for E&D funds unless the applicant began providing public transportation service on or before January 1, 1998.

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[3] As authorized under § 5501.07 of the Ohio Revised Code.

PROSPECTIVE FINANCING TECHNIQUES

State Infrastructure Bank

The federal government established a State Infrastructure Bank (SIB) program[4] in 1995 through the National Highway System Designation Act. A SIB is a state or multi-state fund that can be used by eligible borrowers to finance transportation projects.

The purpose of a SIB is to attract new funding into transportation, to encourage innovative approaches to financing transportation projects, and to help build needed transportation infrastructure. A SIB operates much like a commercial bank. It provides loans or credit enhancements (lines of credit, letters of credit, debt service guarantees) which can be used to finance projects. When the loans are repaid or the obligation for the credit enhancements expire, the funds are returned to the SIB, recycled, and then used to finance another set of projects. Because funds are repaid and returned to the SIB, a permanent, flexible use fund for transit and highways is created in order to help states meet their transportation funding needs.

The Ohio SIB program[5] was capitalized with a $30 million authorization from the Ohio State Legislature in 1996 and also approximately $60 million annually in Federal Title XXIII Highway Funds. Any highway or transit project eligible under Title XXIII, as well as aviation, rail and other intermodal transportation facilities, is eligible for direct loan funding under the SIB. Bonds can also be issued under the SIB program for projects, as long as sufficient revenues are available to support such projects.

ODOT's objective is to maximize the use of Federal and State funds in order to make direct loans to eligible projects. Repayments from these loans will be made to ODOT and then reloaned to subsequent projects, hence creating a SIB revolving loan program. The SIB revolving loan program will enhance the number of transportation projects that can be completed within the State that otherwise would not have been considered for traditional grant funds in the past or are not ranked on the State Transportation Improvement Program (STIP).

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[4] National Highway System Designation Act of 1995, Public Law Number 104-59, as amended.

[5] Ohio Revised Code, Chapter 5501.

ODOT will be the primary decision maker for SIB projects. Within ODOT, the Executive Funds Management Committee will manage the approval process. ODOT's Office of Economic Development will promulgate the application process and will be the contact source for information on the program. The Office of Economic Development will receive applications, review, and make recommendations to the Executive Funds Management Committee.

Key Eligibility Requirements

Qualified borrowers include any public entity, such as political subdivisions, other state agencies, boards, or commissions, regional transit boards, and port authorities. Private companies and nonprofit organizations are eligible, but must have a local government sponsor to receive funding.

Any highway or transit project eligible under the Federal Title XXIII Highway Act is eligible for SIB funding. Other transportation projects, including rail, aviation, and other intermodal facilities will also be considered for SIB funding. These projects, if not eligible for federal funds under Title XXIII, may be funded from other sources such as State appropriations or other available funds. Projects funded with federal monies and listed on the State Transportation Improvement Plan (STIP) will be limited to the amount approved by the STIP. The State may elect to finance up to 100% of the project using SIB funds as the local match.

The Office of Economic Development staff will evaluate the following to determine the eligibility of each project:

- Ability to Repay
- Management of Project
- Working Capital/Operating Funds
- Need/Public Benefit
- Collateral
- Status of Project in Relation to Actual Construction Startup

When and How Successfully Applied

- The GCRTA received $6,945,000 for the Cleveland Viaduct project.
- The City of Canton received $1,200,000 from the Ohio SIB in support of downtown redevelopment efforts.
- The Ohio Southern Railroad received $2,020,000 for rail rehabilitation.

Schedule and Other Considerations

The Director of ODOT must approve all projects. Title XXIII projects must be listed in the State Transportation Improvement Plan (STIP). To assure the lowest risk to the State Infrastructure Bank, the following elements will be considered prior to a funding commitment:

- The environmental assessment and subsequent clearance process must be complete to the extent required to meet the funding source requirements;
- The preliminary engineering including any required studies such as, but not limited to, the Major Investment Study, Interchange Justification Analysis, Wetlands Analysis and

Mitigation Plan, as well as any other funding source requirements must be completed prior to loan closing;

- The project must have an identifiable revenue stream or source that will likely amortize the debt. Such revenue sources may include:
  - » Local government pledges
  - » Toll proceeds
  - » Tax increment financing (TIFs)
  - » Property assessments
  - » License plate and registration fees
  - » Issue 2 local government funds
  - » Overbuy land proceeds
  - » Other user payments and/or fees, such as parking structure revenues, docking and landing fees, passenger facility charges, etc.

The term of the financing will be based upon the useful life of the assets being financed. The maximum term for a loan or bond will be 25 years; there will be no minimum term. The project must provide revenue payments beginning within two (2) years of project completion and/or opening to traffic.

Transportation Infrastructure Financing and Innovation Act

USDOT provides loans, letters and lines of credit, and loan guarantees for surface transportation projects of National significance, as authorized under the Transportation Infrastructure Financing and Innovation Act (TIFIA)[6]. Such loans and guarantees can be provided to public and private sponsors of highway, rail, transit, and intermodal projects. Project applications are evaluated and selected by DOT on a competitive basis. Total credit assistance available nationwide is authorized at $1.8 billion in FY 2000 ($90 million in subsidy).

Key Eligibility Requirements
Highway, rail, transit, and intermodal projects may receive credit assistance under TIFIA.
The following threshold criteria must be met:

- Projects must generally cost at least $100 million, and the amount of credit assistance to a project may not exceed 33% of eligible project costs, including capitalized interest.
- Project sponsor must submit a formal application
- Projects must be included in the State transportation plan and State TIP
- Financing must be repayable, in whole or in part, from tolls, user fees, and other dedicated sources (which may include general obligation pledges or corporate promissory pledges, but not a pledge of Federal funds).

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[6] Final Rule implementing the Transportation Infrastructure Financing and Innovation Act (49 CFR Part 80) and U.S. DOT, FY 1999 TIFIA Program Guide.

Transit projects receiving TIFIA assistance must also comply with the rules and requirements governing the FTA grant programs, as well as crosscutting laws and regulations (such as NEPA, Title VI, 13c, etc.).

Selection criteria include the extent to which a project would generate economic benefits, leverage private capital, promote innovative technologies, and meet other transportation objectives.

When and How Successfully Applied
In the first year of the TIFIA program (FY 1999), five projects were selected for $1.6 billion in assistance:

- State Route 125, San Diego ($400 million toll road, TIFIA loan guarantee of $90 million and $37 million line of credit)
- Miami Intermodal Center ($1.4 billion project, two TIFIA loans totaling $436 million)
- Tren Urbano Project, San Juan ($1.7 billion rail project, $300 million TIFIA loan)
- Farley-Penn Station Redevelopment, New York ($750 million project, $140 million TIFIA loan and $20 million line of credit)
- Metro Capital Program, Washington ($2.3 billion capital improvement program, $600 million TIFIA loan guarantee)

Schedule and Other Considerations
Applicants must submit a letter of intent. If approved for further review, applicants are invited to submit a formal application and make an oral presentation. For the FY 1999 funding cycle, letters of interest were required by June 23, 1999 and formal applications had a deadline of August 2. Formal applications require a non-refundable application charge ($5000 in FY 1999). Starting in FY 2000, a credit processing charge may also be assessed. Applicants must also provide a preliminary rating opinion letter from at least one nationally recognized bond-rating agency.

Railroad Rehabilitation and Improvement Loan Fund

Administered by the Federal Railroad Administration, the Railroad Rehabilitation and Improvement Loan Fund (RRIF)[7] is a direct loan and loan guarantee program that may be used to acquire, improve, or rehabilitate intermodal or rail equipment or facilities, including track; to refinance existing debt; or to develop or establish new intermodal or railroad facilities.

Key Eligibility Requirements
A Credit Risk Premium must be provided to FRA by any non-Federal entity. Other requirements include:

- Loans and loan guarantees are subject to NEPA and other environmental laws, Executive Orders, and regulations;
- Application requirements must be met, including payment of an investigation charge;

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[7] Proposed rules were published in the Federal Register on May 20, 1999.

- FRA establishes the Credit Risk Premium by estimating risk and potential recovery in the event of a default;
- Borrower is required to maintain facilities. FRA representatives must be allowed to inspect and examine any facilities acquired with RRIF assistance.

When and How Successfully Applied

Implementation of the RRIF program awaits the issuance of final rules. A Notice of Proposed Rulemaking was published in the Federal Register on May 20, 1999, and the final rules are under review at OMB.

Schedule and Other Considerations

The aggregate unpaid principal amounts cannot exceed $3.5 billion, of which $1 billion is reserved for projects benefiting non-Class I freight railroads. Within these constraints, FRA gives priority to projects that enhance safety, enhance the environment, promote economic development, are included in state transportation plans, promote U.S. competitiveness, and preserve/enhance service to small communities and rural areas.

Grant Anticipation Revenue Vehicle (GARVEE) Bonds

A GARVEE bond refers to any financing instrument for which principal and/or interest is repayable with future Federal-aid highway funds. The debt is issued in anticipation of the receipt of Federal-aid grant reimbursements in subsequent years.[8]

Key Eligibility Requirements

A project must be eligible for Federal-aid funds under Title 23, U.S.C. Planning, programming, environmental, and other pre-construction requirements must be met. A project must be approved by FHWA as an advance construction project and as a Federal-aid bond issue project. At the time of project authorization, the State must elect to seek reimbursements for bond issue costs in lieu of construction invoice costs.

When and How Successfully Applied

GARVEE bonds are being well received in the credit markets. In the two cases listed below, States have used GARVEE bonds in different ways and created highly rated and very marketable debt instruments:

- Central Artery/Tunnel in Boston, Massachusetts. The Commonwealth issued $600 million of Grant Anticipation Notes in June 1998. The $600 million issue matures in 8 to 17 years and has received ratings of Aa3, AA, and AAA by Moody's, Fitch IBCA, and Duff & Phelps, respectively. The Commonwealth intends to pay interest from state highway funds but retire principal with Federal-aid reimbursements.
- Spring-Sandusky Interchange in Columbus, Ohio. The State of Ohio issued $70 million worth of bonds in May 1998. The bonds will mature in 10 years. The bonds received ratings of Aa3 from Moody's and AA- from both Standard & Poors and Fitch IBCA.

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[8] 23 U.S.C. Section 122; FHWA, Innovative Finance Quarterly, Volume 3 Number 2 (Fall 1997); and FHWA, Innovative Finance Quarterly, Volume 4 Number 3 (Summer 1998).

Schedule and Other Considerations

The GARVEE bond concept can be applied in two ways:

- A “direct” GARVEE bond in which federal assistance directly reimburses debt service paid to investors in a debt-financed Federal-aid project.
- An “indirect” reimbursement whereby federal funds reimburse expenditures on other Federal-aid projects and the State DOT subsequently uses a portion of those funds to pay debt service on the debt-financed project. In this case, the debt-financed project need not be a Federal-aid project.

A high volume of Federal-aid projects built under advance construction authority creates a favorable environment for an indirect reimbursement strategy. These projects can be readily converted to Federal-aid, creating “quick cash” that can be applied to debt service.

Appendix I:
Train Schedules, Railroad Configuration and Infrastructure Improvements

1. Operational Characteristics by Route
2. Hypothetical Timetables
3. String Diagrams
4. Stick Diagrams

[Route 6]
East Corridor

Cleveland-Solon-Aurora-Mantua via NS Cleveland Line NS Randall Secondary

Service planning assumptions:

- Third track required along NS Cleveland Line between Downtown Cleveland and Erie Crossing (junction with Randall Secondary)

- Randall Secondary has limited freight service.

- With this extra track, a dedicated commuter line can be created over entire route, with potentially strong reverse-commuter market, so LOS 3 is appropriate to take advantage of investment in capacity

- Current track ends at Chamberlain Road, 1+ miles east of Aurora. East end of track recently upgraded to provide service to plastics plant at Chamberlain Road. Potential extension 4+ miles to Mantua following former Erie ROW.

Operational Characteristics:

Scenario 61 / 62	**Scenario 5***	**Scenario 6***	**Scenario 63**
LOS 1 or LOS 2 to Aurora	**LOS 3 to Aurora**	**LOS 3 to Mantua**	**LOS 3 to Mantua shorter headways**
3 trainsets, plus spares	3 trainsets, plus spares	4 trainsets, plus spares	5+ trainsets, plus spares
45 min. peak headway	45 min. peak headway	35 min. peak headway	20-30 min. pk. headway
LOS 1: No reverse peak; LOS 2: 1 reverse peak	4 reverse peak trips	4 reverse peak trips	4+ reverse peak trips
LOS 1: No off-peak; LOS 2: 1 off-peak trip	Bi-hourly or hourly off-peak service	Bi-hourly or hourly off-peak service	Bi-hourly or hourly off-peak service

*Timetables and stringline diagrams attached.

Potential Capital Projects:

Scenario 61 / 62	Scenario 5	Scenario 6	Scenario 63
LOS 1 or LOS 2 to Aurora	**LOS 3 to Aurora**	**LOS 3 to Mantua**	**LOS 3 to Mantua shorter headways**
3rd main track, NCTC to Erie Crossing	3rd main track, NCTC to Erie Crossing	3rd main track, NCTC to Erie Crossing	3rd main track, NCTC to Erie Crossing
Passing siding – Kinsman (E.79th to Union Ave.)	Passing siding – Kinsman (E.79th to Union Ave.)	Passing siding – Kinsman (E.79th to Union Ave.)	Passing siding – Kinsman (E.79th to Union Ave.)
Passing siding – Harper Rd. to Solon	Passing siding – Harper Rd. to Solon	Passing siding – Harper Rd. to Solon	Passing siding – Harper Rd. to Solon
		Passing siding – Aurora	Passing siding – Aurora
Track upgrade, NS Randall Secondary	Track upgrade, NS Randall Secondary	Track upgrade, NS Randall Secondary	Track upgrade, NS Randall Secondary
Grade crossing upgrades	Grade crossing upgrades	Grade crossing upgrades	Grade crossing upgrades
Stations (see below)	Stations (see below)	Stations (see below)	Stations (see below)
Overnight storage yard: Aurora (3 trainsets)	Overnight storage yard: Aurora (3 trainsets)	Overnight storage yard: Mantua (4 trainsets)	Overnight storage yard: Mantua

*Scope and estimated cost dependent upon extent of regional rail service at Cleveland.

In the case of Scenario 63, with shorter peak headways (e.g., 30 min. or less):

- additional 4th track required along embankment from Kinsman Yard towards E.55th/Union station
- additional double-tracking of Randall Secondary required.

If additional trains in the CAC corridor are operated on the line between Cleveland and Erie Crossing (shared between Routes 4 and 6),

- CAC LOS 2 possible with 3 tracks, NCTC to Erie Crossing
- CAC LOS 3 + Aurora/Mantua requires either a 4th track, NCTC to Erie Crossing, or diversion of significant volumes of through freight traffic via Erie-Nickel Plate connection (described below)

Stations – Route 6 – East Corridor – Solon-Aurora-Mantua:

The following station locations have been assumed for purposes of ridership estimating and capital costing. They include a mix of town center and park-and-ride locations, are based on input from local stakeholders, and represent a reasonable set of assumptions for feasibility analysis and decision-making. Actual locations and implementation priorities may change as the design and implementation process progresses.

Station:	**Street location:**	**Transit connections**	**Type**
Cleveland - NCTC	W.3rd-E.9th Sts.	LRT, buses	
E.55th / Euclid	Euclid Av., E.55th St.	Buses	
E.88th / Union	Union Ave.	Buses, NEORAIL	
E.131 St.	E.131 St. & Miles Ave.		T
North Randall	Warrensville Ctr. Rd.		P
Harper Rd	Harper Rd	Distrib buses	P
Solon	SR 91		T,P
Geauga Lake / Six Flags	At amusement park entrance		Special
Bainbridge / Sea World	Brewster Rd.		P
Aurora	SR 82		T,P
Mantua	SR 44		P

T=town center; P=park and ride available.

Erie-Nickel Plate Connection

Erie Crossing and Cloggsville via NS Randall Secondary and Nickel Plate Line

Configuration:

- Double-track route, connects with NS Rockport-Cloggsville line
- Max. 1% grade, less vertical rise than lakefront route

Purpose:

Provide an alternate route through Cleveland for NS mainline trains, to create capacity for additional passenger trains on the lakefront route.

NEORail Routes Benefited:

- All routes operating across Cuyahoga River west of NCTC (1, 2, 3)
- All routes operating between NCTC and Erie Crossing (4D, 4E and 6)
- Also benefits 3-C and Midwest high-speed rail corridor service

Elements of construction:

- Reconstruct interlocking on NS Nickel Plate Line
- New railroad grade connecting Nickel Plate and Erie (Randall Secondary) lines east of E.34th Street
- Install track on former Erie-CUT connection alignment across Nickel Plate bridge

- Upgrade Erie line (Randall Secondary) to Class IV track with signals and centralized traffic control (CTC), from Nickel Plate connection to Erie Crossing
- Modify track curvature for higher speed on connecting tracks at Erie Crossing
- New interlocking with NS Cleveland-Pittsburgh main line in Harvard vicinity

Railroad grades:

One reason cited by NS and others for not advancing this project at the time of the Conrail break-up is the grade of the connection between the two lines at E.37th Street. Topographic base mapping of the area was obtained at a scale of 1”=200’, with two-foot contours. The grade of the alignment that uses the existing Erie-CUT bridge is approximately 1.3 percent – between the controlling vertical constraints of the rail bridge over NS and the underside of the E.34th Street overpass. This contrasts with the current grades on the NS mainline, which reach a maximum of 0.91 percent west of the Cuyahoga River and 0.78 percent east of the river.

However, if a new grade is created on the southern side of both the Nickel Plate and Erie rights-of-way, a longer distance is available to make the vertical transition, and the maximum grade can be limited to 1.0 percent or less. Covering a distance of only 3,000 feet, this grade is not significantly different from the existing mainline grade and might prove to be acceptable to NS, considering that the total vertical rise of the railroad from the Cuyahoga River to Erie Crossing is approximately 50 feet less than via the lakeshore route.

Operations:

In round numbers, anticipated traffic on the two NS lines across the Cuyahoga River, without commuter rail, is estimated to be on the order of 75 daily trains – with approximately 50 using the lakeshore route and 25 using the Nickel Plate bridge. With the proposed Erie-Nickel Plate connection, coupled with the recently-completed Rockport-Cloggsville connection, the high level Nickel Plate bridge could be used by at least some westbound NS through trains, where the 1.0 percent grade should not be a significant issue.

Should the capacity and energy savings to NS be great enough, and if there is sufficient capacity to combine the majority of trains on both the Chicago-Pittsburgh and Chicago-Buffalo routes over the Nickel Plate bridge, then this route could become the preferred mainline route for NS trains through Cleveland. The existing lakefront line stretching eastward from the NCTC to Erie Crossing and westward to Brook Park and Hopkins Airport would then become primarily a reliever route for NS, while also continuing to serve port-related and local customer traffic. Daily traffic levels could shift to the point where the high level bridge would carry approximately 50 daily trains, with the remaining 25 trains using the lakefront route. This shift would provide capacity along the lakefront route that could be used by passenger trains, conceivably reducing the required magnitude of investment – or delaying the need for that investment – in additional capacity along the lakefront.

However, given the anticipated growth in the level of both freight and passenger traffic through Cleveland, long-range plans will also likely need to include increasing the capacity of the Cuyahoga River rail crossing along the lakeshore line.

Advantages:

- Fuel savings (saves vertical rise of approx. 45 ft. for through trains)
- Capacity (double-track line at higher level and further upstream than lakefront bridge – resulting in fewer bridge openings)
- Both ends of Rockport Yard directly accessible from main line
- Increased separation of freight and passenger traffic

Potential drawbacks:

- Capacity of two-track bridge must be shared between NS Buffalo and Pittsburgh routes
- Train staging requirements on proposed right-of-way, for Nickel Plate Yard and/or Rockport Yard, may require additional investment to provide a clear double-track route for through trains.

[Route 1]
Lake West Corridor

Cleveland-Lakewood-Lorain via NS Chicago Line, to NS Nickel Plate Line

Service planning assumptions

- Limited operations using existing Cuyahoga River lift bridge

- Increased operations, assuming either the Erie-Nickel Plate connection or a new Cuyahoga River lift bridge

- Track connection at Alcott between NS Chicago Line and NS Nickel Plate Line, within former right-of-way

- Grove site terminal facility at Lorain for commuter rail (north of Nickel Plate main line)

Operational Characteristics:

Scenario 22	Scenario 23	Scenario 24*	
LOS 1 to Lorain	**LOS 2 to Lorain**	**LOS 3 to Lorain**	
3 trainsets, plus spares	3 trainsets, plus spares	3 trainsets, plus spares	
45 min. peak headway	35 min. peak headway	35 min. peak headway	
No reverse peak service	1 reverse peak trip	2 reverse peak trips	
No off-peak service	1 mid-day round trip	3 mid-day round trip	
3 daily round trips	6 daily round trips	11 daily round trips	

*Timetables and stringline diagrams attached.

Potential Capital Projects:

Scenario 22	Scenario 23	Scenario 24	
LOS 1 to Lorain	**LOS 2 to Lorain**	**LOS 3 to Lorain**	
N. Coast Transp.Ctr. (NCTC)*	NCTC*	NCTC*	
E.26th St. Yard & Shop*	E.26th St. Yard & Shop*	E.26th St. Yard & Shop*	
	Erie-Nickel Plate Connection	Erie-Nickel Plate Connection	Alternate: New Cuyahoga River lift bridge (4 main trks.)
3rd main track, Cuy. Riv. to Alcott Jct.	3rd main track, Cuy. Riv. to Alcott Jct.	3rd main track, Cuy. Riv. to Alcott Jct.	3rd and 4th main track, Cuy. Riv. to Alcott Jct.
Alcott connection (NS Chicago Line & NS Nickel Plate Line)	Alcott connection	Alcott connection	
Grade crossing upgrades – Lakewood	Grade crossing upgrades – Lakewood	Grade crossing upgrades – Lakewood	Alternate: positive barrier & 4-quadrant crossing gates to improve level of safety
Grade crossing upgrades – Rocky River-Lorain	Grade crossing upgrades – Rocky River-Lorain	Grade crossing upgrades – Rocky River-Lorain	
	Passing siding extension – Rocky River	Passing siding extension to Webb Av. Lakewood	
	Passing siding – Avon	Passing siding – Avon	
Lorain Grove Site track connection	Lorain Grove Site track connection	Lorain Grove Site track connection	
Track upgrade,	Track upgrade,	Track upgrade,	

NS Nickel Plate Line	NS Nickel Plate Line	NS Nickel Plate Line	
Stations (see below)	Stations (see below)	Stations (see below)	
Overnight storage yard: Lorain (3 trainsets)	Overnight storage yard: Lorain (3 trainsets)	Overnight storage yard: Lorain (3 trainsets)	

*Scope and estimated cost dependent upon extent of regional rail service at Cleveland.

Stations – Route 1 – Lake West Corridor – Lorain:
The following station locations have been assumed for purposes of ridership estimating and capital costing. They include a mix of town center and park-and-ride locations, are based on input from local stakeholders, and represent a reasonable set of assumptions for feasibility analysis and decision-making. Actual locations and implementation priorities may change as the design and implementation process progresses.

Station:	**Street location:**	**Transit connections**	**Type**
Cleveland - NCTC		LRT, buses	
Lakewood	St. Charles Ave.	Buses	T
Rocky River	Former station location		T,P
Westlake / Bay Village	Columbia Rd.		P
Avon	SR 83		P
Sheffield / East Lorain	Lake Breeze Rd.		P
Lorain Grove Site	US 6 & Broadway		T,P

T=town center; P=park and ride available.

[Routes 4D and 4E]
South Corridor

Cleveland-Akron-Canton (CAC Corridor) via NS Cleveland Line Wheeling & Lake Eire RR Akron Metro rights-of-way

Major Investment Study underway in this corridor. Study is addressing the same two potential commuter rail routes, plus light rail (in interstate highway corridor), bus service improvements and highway improvements.

Service planning assumptions:

- NS mainline – new commuter track will be built (extent and location to be determined), so service level beyond LOS 1 is desirable to take advantage of investment in capacity
- Potentially strong commuter demands to Akron & Canton favor bi-directional service
- Bi-directional service on Canton line requires significant incremental investment in signals and passing sidings
- LOS 2 service designed to match available slots between NCTC and Erie Crossing (assuming Route 6 is also in service)
- LOS 3 achieves 35 min. peak headways – meshes with Route 6 service.

Level of service scenarios:

- LOS 2 in CAC Corridor, 4 trains to Cleveland, 1 Akron reverse-peak, 1 Canton reverse peak (as applicable)
    - Service options:

Clev-Hudson-Akron-Canton	(5 trainsets)
Clev-Hudson-Akron	(4 trainsets)
Clev-Hudson-Cuyahoga Falls	(3 trainsets)
Clev-Kent-Akron-Canton	(6 trainsets)
Clev-Kent-Akron	(5 trainsets)
Clev-Kent	(3 trainsets)

    - Station options and associated infrastructure requirements – Akron area
        - Station location options
            - Quaker Square
            - N. Main Street – W&LE
            - N. Howard Street – CV
        - Associated track connection options
            - Arlington flyover (Q.Sq.)
            - Scrap yard connection (N. Howard St.)
            - Wheeling connection (N. Main St.)
            - CSX alignment shift (Q.Sq.)

- LOS 3 in CAC Corridor
    - Service options:

Clev-Hudson-Akron-Canton	(7 trainsets)
Clev-Hudson-Akron	(5 trainsets)
Clev-Kent-Akron-Canton	(8 trainsets)
Clev-Kent-Akron	(6 trainsets)

- Additional infrastructure requirements – NCTC to E.88th/Union
    - 4th mainline track, or significant diversion of freight traffic via Erie-Nickel Plate connection

- Additional infrastructure requirements – Hudson route
    - Additional passing siding – Walton Hills/Motor Yard
      Additional infrastructure requirements – Kent route
    - Additional passing sidings

Operational Characteristics – Route 4D via Hudson:

Scenario 12*	Scenario 13	Scenario 18*	Scenario 19
LOS 2 Clev-Akron via Hudson **LOS 1 Akron-Canton**	**LOS 2 Clev-Akron via Hudson**	**LOS 3 Clev-Akron via Hudson** **LOS 2 Akron-Canton**	**LOS 3 Clev-Akron via Hudson**
4 trainsets, plus spares	3 trainsets, plus spares	7 trainsets, plus spares	5 trainsets, plus spares
60-70 min. peak headway	60-70 min. peak headway	35 min. peak headway	35 min. peak headway
1 reverse peak trip to Akron, 1 to Canton	1 reverse peak	3 reverse peak trips to Akron, 3 to Canton	3 reverse peak trips
1 mid-day round trip	1 mid-day round trip	Bi-hourly off-peak service	Bi-hourly off-peak service

*Timetables and stringline diagrams attached.

Potential Capital Projects – Route4D via Hudson:

Scenario 12	Scenario 13	Scenario 18	Scenario 19
LOS 2 Clev-Akron via Hudson **LOS 1 Akron-Canton**	**LOS 2 Clev-Akron via Hudson**	**LOS 3 Clev-Akron via Hudson** **LOS 2 Akron-Canton**	**LOS 3 Clev-Akron via Hudson**
3rd main track, NCTC to Erie Crossing	3rd main track, NCTC to Erie Crossing	3rd main track, NCTC to Erie Crossing	3rd main track, NCTC to Erie Crossing
Passing siding – Kinsman (E.79th to Union Ave.)	Passing siding – Kinsman (E.79th to Union Ave.)	Passing siding – Kinsman (E.79th to Union Ave.)	Passing siding – Kinsman (E.79th to Union Ave.)
Track connection – Union Av.–Harvard Av.	Track connection – Union Av.–Harvard Av.	Track connection – Union Av.–Harvard Av.	Track connection – Union Av.–Harvard Av.
3rd main track, NS, Harvard—White	3rd main track, NS, Harvard—White	3rd main track, NS, Harvard—White	3rd main track, NS, Harvard—White

		Passing siding – Garfield Hts. (NS)	Passing siding – Garfield Hts. (NS)
NS-W&LR track connection at White	NS-W&LR track connection at White	NS-W&LR track connection at White	NS-W&LR track connection at White
W&LE track upgrade, White-Bedford	W&LE track upgrade, White-Bedford	W&LE track upgrade, White-Bedford	W&LE track upgrade, White-Bedford
3rd main track, NS, Bedford—Hudson (full or partial)	3rd main track, NS, Bedford—Hudson (full or partial)	3rd main track, NS, Bedford—Hudson	3rd main track, NS, Bedford—Hudson
		Passing siding – Walton Hills (NS)	Passing siding – Walton Hills (NS)
Upgrade interlockings to CTC remote control	Upgrade interlockings to CTC remote control	Upgrade interlockings to CTC remote control	Upgrade interlockings to CTC remote control
Hudson junction improvements	Hudson junction improvements	Hudson flyover	Hudson flyover
New track, Hudson-Arlington	New track, Hudson-Arlington	New track, Hudson-Arlington	New track, Hudson-Arlington
Passing sidings – Hudson, Cuy.Falls	Passing sidings – Hudson, Cuy.Falls	Passing sidings – Hudson, Cuy.Falls	Passing sidings – Hudson, Cuy.Falls
Arlington connection to Akron Station (one of several options)	Arlington connection to Akron Station (one of several options)	Arlington connection to Akron Station (one of several options)	Arlington connection to Akron Station (one of several options)
Akron-Canton connection (one of several options)		Akron-Canton connection (one of several options)	
Grade crossing upgrades	Grade crossing upgrades	Grade crossing upgrades	Grade crossing upgrades
Stations (see below)	Stations (see below)	Stations (see below)	Stations (see below)
Overnight storage yards: Akron, Canton	Overnight storage yard: Akron	Overnight storage yards: Akron, Canton	Overnight storage yard: Akron

*Scope and estimated cost dependent upon extent of regional rail service at Cleveland.

Operational Characteristics – Route 4E via Kent:

Scenario 15*	Scenario 16	Scenario 20	Scenario 21
LOS 2 Clev-Akron via Kent **LOS 1 Akron-Canton**	**LOS 2 Clev-Akron via Kent**	**LOS 3 Clev-Akron via Kent** **LOS 2 Akron-Canton**	**LOS 3 Clev-Akron via Kent**
5 trainsets, plus spares	4 trainsets, plus spares	8 trainsets, plus spares	6 trainsets, plus spares
60-70 min. peak headway	60-70 min. peak headway	35 min. peak headway	35 min. peak headway
1 reverse peak trip to Akron, 1 to Canton	1 reverse peak	3 reverse peak trips to Akron, 3 to Canton	3 reverse peak trips
1 mid-day round trip	1 mid-day round trip	Bi-hourly off-peak service	Bi-hourly off-peak service

*Timetables and stringline diagrams attached.

Potential Capital Projects – Route 4E via Kent:

Scenario 15	Scenario 16	Scenario 20	Scenario 21
LOS 2 Clev-Akron via Kent **LOS 1 Akron-Canton**	**LOS 2 Clev-Akron via Kent**	**LOS 3 Clev-Akron via Kent** **LOS 2 Akron-Canton**	**LOS 3 Clev-Akron via Kent**
3rd main track, NCTC to Erie Crossing	3rd main track, NCTC to Erie Crossing	3rd main track, NCTC to Erie Crossing	3rd main track, NCTC to Erie Crossing
Passing siding – Kinsman (E.79th to Union Ave.)	Passing siding – Kinsman (E.79th to Union Ave.)	Passing siding – Kinsman (E.79th to Union Ave.)	Passing siding – Kinsman (E.79th to Union Ave.)
Track connection – Union Av.–Harvard Av.	Track connection – Union Av.–Harvard Av.	Track connection – Union Av.–Harvard Av.	Track connection – Union Av.–Harvard Av.
3rd main track, NS, Harvard—White	3rd main track, NS, Harvard—White	3rd main track, NS, Harvard—White	3rd main track, NS, Harvard—White
		Passing siding – Garfield Hts. (NS)	Passing siding – Garfield Hts. (NS)
NS-W&LE track connection at White	NS-W&LE track connection at White	NS-W&LE track connection at White	NS-W&LE track connection at White
W&LE track upgrade, White-Kent	W&LE track upgrade, White-Kent	W&LE track upgrade, White-Kent	W&LE track upgrade, White-Kent
Track upgrade and curve modifications, W&LE	Track upgrade and curve modifications, W&LE	Track upgrade and curve modifications, W&LE	Track upgrade and curve modifications, W&LE
Upgrade Plum Jct. connection	Upgrade Plum Jct. connection	Upgrade Plum Jct. connection	Upgrade Plum Jct. connection

New track, Kent-Arlington	New track, Kent-Arlington	New track, Kent-Arlington	New track, Kent-Arlington
Arlington connection to Akron Station (depends upon station location)	Arlington connection to Akron Station (depends upon station location)	Arlington connection to Akron Station (depends upon station location)	Arlington connection to Akron Station (depends upon station location)
Akron-Canton connection (one of several options)		Akron-Canton connection (one of several options)	
Grade crossing upgrades	Grade crossing upgrades	Grade crossing upgrades	Grade crossing upgrades
Stations (see below)	Stations (see below)	Stations (see below)	Stations (see below)
Overnight storage yards: Akron, Canton	Overnight storage yard: Akron	Overnight storage yards: Akron, Canton	Overnight storage yard: Akron

*Scope and estimated cost dependent upon extent of regional rail service at Cleveland.

Stations – Route 4:

The following station locations have been assumed for purposes of ridership estimating and capital costing. They include a mix of town center and park-and-ride locations, are based on input from local stakeholders, and represent a reasonable set of assumptions for feasibility analysis and decision-making. Actual locations and implementation priorities may change as the design and implementation process progresses.

Route 4D – South Corridor – Cleveland-Hudson-Akron-Canton

Station:	**Street location:**	**Transit connections**	**Type**
Cleveland - NCTC	W.3rd-E.9th Sts.	LRT, buses	
E.55th / Euclid	Euclid Av., E.55th St.	Buses	
E.88th / Union	Union Ave.	Buses, NEORAIL	
Garfield Heights	I-480		P
Bedford	Grace St.		T,P
Walton Hills	Alexander Rd.		P
Macedonia	E. Aurora Rd./SR 82		T,P
Hudson	Milford Rd./Hudson Plaza		T,P
Silver Lake	Graham Rd.		P
Cuyahoga Falls	Broad Blvd.		T,P
Akron, at one of three sites: ▪ Quaker Square ▪ N. Main St. (W&LE) ▪ N. Howard St.(CVSR)	▪ Broadway & University Ave. ▪ N. Main St. (W&LE) ▪ N. Howard St.(CVSR)	Buses Buses Buses	T T T
Triplett Boulevard	Triplett Blvd.		P
Myersville	SR 619 / Edison St.		P

Akron-Canton Airport	Mt. Pleasant St.		P
North Canton	Everhard Rd./Belden Vill.		P
Football Hall of Fame	Fulton Dr.		
Canton	Tuscarawas St		T,P

Route 4E – South Corridor – Cleveland-Kent-Akron-Canton

Station:	**Street location:**	**Transit connections**	**Type**
Cleveland to Garfield Hts.	[Same]		
Bedford	W&LE station (town center)		T,P
Glenwillow	Pettibone Rd.		P
Twinsburg	E. Aurora Rd./SR 82		P
Streetsboro	Mondial Pkwy. (s. of Ohio Tpke.)		P
Kent-South	SR 261		P
Kent-Downtown	E. Main St. & Water St.		T
Tallmadge	Erie St. & Southeast Ave.		T,P
Akron/Quaker Square	Broadway & University Ave.	Buses	T
Akron to Canton	[Same]		

[Route 2]
West Corridor

Cleveland-Elyria-Amherst via NS Chicago Line

Service planning assumptions:

- LOS 1 or 2: Limited operations using existing Cuyahoga River lift bridge
    - 3rd mainline track from Cuyahoga River to some point beyond Berea (e.g., North Ridgeville or Elyria)
    - Commuter passing sidings for LOS 2

- LOS 3: Increased operations, assuming new bridge
    - MWRRI and 3-C high-speed rail services assumed to be operating
    - Operations & hypothetical timetable at LOS 3, incl. MWRRI and 3-C
    - Dedicated 2-track passenger railroad from NCTC to Berea or North Ridgeville
    - Separate alignment through Hopkins Airport / Berea area, to alleviate rail bottleneck and better serve airport terminal

- NS Chicago Line between Cuyahoga River and Hopkins Airport
    - Without Erie-Nickel Plate connection, 4-track mainline assumed to be required from NCTC to vicinity of Hopkins Airport
    - With Erie-Nickel Plate connection, 3-track mainline assumed to be required from NCTC to vicinity of Hopkins Airport.

Operational Characteristics:

Scenario 25	Scenario 26	Scenario 27*	Scenario 29*
LOS 1 to Elyria	**LOS 2 to Elyria**	**LOS 2 to Amherst**	**LOS 3 to Amherst**
3 trainsets, plus spares	3 trainsets, plus spares	3 trainsets, plus spares	4 trainsets, plus spares
45 min. peak headway	35 min. peak headway	35 min. peak headway	35 min. peak headway
No reverse peak service	1 reverse peak trip	1 reverse peak trip	2 reverse peak trips
No off-peak service	1 mid-day round trip	1 mid-day round trip	3 mid-day round trip
3 daily round trips	6 daily round trips	6 daily round trips	11 daily round trips

*Timetables and stringline diagrams attached.

Potential Capital Projects:

Scenario 25	Scenario 26	Scenario 27	Scenario 29
LOS 1 to Elyria	**LOS 2 to Elyria**	**LOS 2 to Amherst**	**LOS 3 to Amherst**
N. Coast Transp.Ctr. (NCTC)*	NCTC*	NCTC*	
E.26th St. Yard & Shop*	E.26th St. Yard & Shop*	E.26th St. Yard & Shop*	
Erie-Nickel Plate Connection	Erie-Nickel Plate Connection	Erie-Nickel Plate Connection	
			New Cuyahoga River lift bridge (4 main trks.)
3rd main track, Cuy. Riv. to Elyria: ▪ NS ROW to Alcott ▪ N.side industrial track Alcott-Puritas ▪ Deep cut alignment through freeway interchange area ▪ NS ROW adjacent to airport & at Berea	3rd main track, Cuy. Riv. to Elyria: ▪ NS ROW to Alcott ▪ N.side industrial track Alcott-Puritas ▪ Deep cut alignment through freeway interchange area ▪ NS ROW adjacent to airport & at Berea	3rd main track, Cuy. Riv. to Elyria: ▪ NS ROW to Alcott ▪ N.side industrial track Alcott-Puritas ▪ Deep cut alignment through freeway interchange area ▪ NS ROW adjacent to airport & at Berea	4-track mainline, Cuy. Riv. to Berea: ▪ Existing NS ROW to I-71/I-480 overpass, w/ bridge modifications as required ▪ Occupies RTA Red Line ROW through Brookpark (Red Line relocated to deep cut section)

			▪ Separate 2-track alignment through airport terminal area
Flyover or underpass of NS alignment west of airport	Flyover or underpass of NS alignment west of airport	Flyover or underpass of NS alignment west of airport	Flyover or underpass of NS alignment west of airport
2 passenger tracks thru Berea in center of ROW	2 passenger tracks thru Berea in center of ROW	2 passenger tracks thru Berea in center of ROW	2 passenger tracks thru Berea in center of ROW
3rd main track, Berea to Elyria (south side)	3rd main track, Berea to Elyria (south side)	3rd main track, Berea to Amherst (south side)	3rd main track, Berea to Amherst (south side)
	Passing siding – West Park	Passing siding – West Park	
	Passing siding – Berea to North Ridgeville	Passing siding – Berea to North Ridgeville	Passing siding – Berea to North Ridgeville
		Passing siding – Elyria	Passing siding – Elyria
Track upgrade, NS Chicago Line	Track upgrade, NS Chicago Line	Track upgrade, NS Chicago Line	Track upgrade, NS Chicago Line
Grade crossing upgrades	Grade crossing upgrades	Grade crossing upgrades	Grade crossing upgrades
Stations (see below)	Stations (see below)	Stations (see below)	Stations (see below)
Overnight storage yard: Elyria	Overnight storage yard: Elyria	Overnight storage yard: Amherst	Overnight storage yard: Amherst

*Scope and estimated cost dependent upon extent of regional rail service at Cleveland.

Stations – Route 2 – West Corridor – Elyria-Amherst:

The following station locations have been assumed for purposes of ridership estimating and capital costing. They include a mix of town center and park-and-ride locations, are based on input from local stakeholders, and represent a reasonable set of assumptions for feasibility analysis and decision-making. Actual locations and implementation priorities may change as the design and implementation process progresses.

Station:	**Street location:**	**Transit connections**	**Type**
Cleveland - NCTC		LRT, buses	
Hopkins Airport	Airport Terminal	RTA Red Line	P
Berea	Front St.		T,P
Olmsted Falls	Depot St.		T,P
North Ridgeville	SR 10		P

Elyria	East St.		T,P
Amherst	SR 58 & Ohio Tpke.		P

T=town center; P=park and ride available.

[Route 3]
Southwest Corridor

Cleveland –Medina via NS Chicago Line and CSX Cleveland Line

Service planning assumptions:

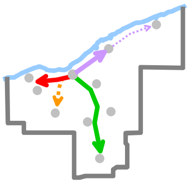
- Operations, assuming new bridge
    - Operations & hypothetical timetable at LOS 2 or LOS 3, on top of NEORAIL Route 2, MWRRI and 3-C

- Same NCTC to Berea and Hopkins Airport area solutions
- Alternative NS-CSX connection alignments
- Passing sidings
- Storage & maintenance facilities
- Stations
- Capital projects and estimated costs

Operational Characteristics:

Scenario 32	Scenario 33*	Scenario 34*	Routing Alternates
LOS 1 to Medina	**LOS 2 to Medina**	**LOS 3 to Medina**	
3 trainsets, plus spares	3 trainsets, plus spares	4 trainsets, plus spares	
45 min. peak headway	35 min. peak headway	35 min. peak headway	
No reverse peak service	1 reverse peak trip	2 reverse peak trips	
No off-peak service	1 mid-day round trip	3 mid-day round trip	
3 daily round trips	6 daily round trips	11 daily round trips	

*Timetables and stringline diagrams attached.



Required Capital Projects:

Scenario 32	Scenario 33	Scenario 34	Routing Alternates
LOS 1 to Medina	**LOS 2 to Medina**	**LOS 3 to Medina**	
N. Coast Transp.Ctr. (NCTC)*	NCTC*	NCTC*	
E.26th St. Yard & Shop*	E.26th St. Yard & Shop*	E.26th St. Yard & Shop*	
Erie-Nickel Plate Connection	Erie-Nickel Plate Connection		
		New Cuyahoga River lift bridge (4 main trks.)	
3rd main track, Cuy. Riv. to Hopkins Airport	3rd main track, Cuy. Riv. to Hopkins Airport	3rd main track, Cuy. Riv. to Hopkins Airport	
Grade crossing upgrades – Lakewood	Grade crossing upgrades – Lakewood	Grade crossing upgrades – Lakewood	
	Passing siding extension – Rocky River	Passing siding extension to Webb Av. Lakewood	
	Passing siding – Avon	Passing siding – Avon	
Lorain Grove Site track connection	Lorain Grove Site track connection	Lorain Grove Site track connection	
Track upgrade, NS Chicago Line, CSX Cleveland Line	Track upgrade, NS Chicago Line, CSX Cleveland Line	Track upgrade, NS Chicago Line, CSX Cleveland Line	
Grade crossing upgrades	Grade crossing upgrades	Grade crossing upgrades	
Stations (see below)	Stations (see below)	Stations (see below)	
Overnight storage yard: Medina (3 trainsets)	Overnight storage yard: Medina (3 trainsets)	Overnight storage yard: Medina (4 trainsets)	

*Scope and estimated cost dependent upon extent of regional rail service at Cleveland.

Stations – Route 3 – Southwest Corridor – Medina:

The following station locations have been assumed for purposes of ridership estimating and capital costing. They include a mix of town center and park-and-ride locations, are based on input from local stakeholders, and represent a reasonable set of assumptions for feasibility analysis and decision-making. Actual locations and implementation priorities may change as the design and implementation process progresses.

Stations –Fairground Routing:

Station:	Street location:	Transit connections	Type
Cleveland - NCTC	W.3rd-E.9th Sts.	LRT, buses	
West Park	RTA Red Line West Park station	RTA Red Line	
Hopkins Airport	Airport Terminal		P
Berea/Fairgrounds	Cuy.Co.Fairgrounds		P
Strongsville	SR 82		P
Brunswick / Liverpool	SR 303		P
Lester	SR 57 / Spieth Rd.		P
Medina	SR 18 / Washington St.		T,P

T=town center; P=park and ride available.

Stations – I-71 Routing:

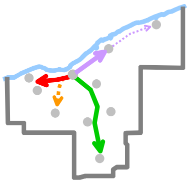
Station:	Street location:	Transit connections	Type
Cleveland – NCTC	[Same]	LRT, buses	
West Park	[Same]	RTA Red Line	
Brook Park	Snow Road at I-71		P
Middleburg Hts.	Bagley Road at I-71		P
Strongsville	[Same]		P
Brunswick / Liverpool	[Same]		P
Lester	[Same]		P
Medina	[Same]		T,P

T=town center; P=park and ride available.

Stations – Rockport Routing:

Station:	Street location:	Transit connections	Type
Cleveland – NCTC	[Same]	LRT, buses	
West Park	[Same]	RTA Red Line	
Brook Park / Parma	Snow Road at Pearl Road		P
Middleburg Hts.	Bagley Road at I-71		P
Strongsville	[Same]		P
Brunswick / Liverpool	[Same]		P
Lester	[Same]		P
Medina	[Same]		T,P

T=town center; P=park and ride available.



[Route 7]
Lake East Corridor

Cleveland-Painesville-Madison-Ashtabula-Conneaut via CSX Cleveland-Buffalo Line

Service planning assumptions:

- Lake County – new commuter track will be built, so LOS 2 or 3 is appropriate to take advantage of investment in capacity
- Ashtabula County – limited ridership w/ peak direction orientation, so LOS 1 is appropriate with minimal investment, contingent upon railroad approval

Operational Characteristics:

Scenario 1	Scenario 2*	Scenario 3*	Scenario 4*
LOS 1 to Painesville	**LOS 2 to Painesville, LOS 1 to Madison/ Conneaut**	**LOS 3 to Painesville, LOS 1 to Madison/ Conneaut**	**LOS 3 to Madison, LOS 1 to Conneaut**
3 trainsets, plus spares	3 trainsets, plus spares	3 trainsets, plus spares	4 trainsets, plus spares
45 min. peak headway	45 min. peak headway	25 min. peak headway	25 min. peak headway
No reverse peak service	1 reverse peak trip to Painesville	2 reverse peak trips to Painesville	2 reverse peak trips to Madison, 1 reverse peak round trip to Painesville
No off-peak service	1 mid-day round trip to Painesville	4 off-peak round trips	4 off-peak round trips
	Painesville trains stored overnight at Cleveland	Painesville train stored overnight at Cleveland	

*Timetables and stringline diagrams attached.

Required Capital Projects:

Scenario 1	Scenario 2	Scenario 3	Scenario 4
LOS to Painesville	**LOS 2 to Painesville, LOS 1 to Madison/ Conneaut**	**LOS 3 to Painesville, LOS 1 to Madison/ Conneaut**	**LOS 3 to Madison, LOS 1 to Conneaut**
N. Coast Transp.Ctr. (NCTC)*	NCTC*	NCTC*	NCTC*
E.26th St. Yard & Shop*	E.26th St. Yard & Shop*	E.26th St. Yard & Shop*	E.26th St. Yard & Shop*

Collinwood Yard bypass	Collinwood Yard bypass		
3rd main track, Collinwood to Painesville	3rd main track, Collinwood to Painesville	3rd main track, Collinwood to Painesville	3rd main track extended to Madison (i.e., Collin-wood-Painesville)
		Passing siding – Wickliffe (permits shorter peak headway)	Passing siding – Wickliffe (permits shorter peak headway)
	Passing siding – Mentor	Passing siding – Mentor	Passing siding – Mentor
		Passing siding – Painesville	Passing siding – Painesville
Track upgrade, CSX main line	Track upgrade, CSX main line	Track upgrade, CSX main line	Track upgrade, CSX main line
Grade crossing upgrades	Grade crossing upgrades	Grade crossing upgrades	Grade crossing upgrades
Stations (see below)	Stations (see below)	Stations (see below)	Stations (see below)
Overnight storage yard: Painesville	Overnight storage yard: Conneaut	Overnight storage yard: Conneaut	Overnight storage yards: Madison (2 trainsets), Conneaut (2 trainsets)

*Scope and estimated cost dependent upon extent of regional rail service at Cleveland.

3rd main track between Collinwood and Painesville generally is the trackbed of the former New York Central railway, which was a 4-track railroad in this area. At __ locations, bridge spans need to be replaced.

Outlying terminal options for Scenarios 2 and 3:

- Conneaut (Painesville train overnights at Cleveland)
- Painesville (all 3 trainsets, if no Ashtabula County service)

LOS 3 to Madison, LOS 1 to Conneaut (4 trainsets, 25 min. peak headway):

  - o Additional passing siding permits shorter peak headway.

Stations – Route 7 – Lake East – Painesville-Madison-Ashtabula-Conneaut:

The following station locations have been assumed for purposes of ridership estimating and capital costing. They include a mix of town center and park-and-ride locations, are based on input from local stakeholders, and represent a reasonable set of assumptions for feasibility analysis and decision-making. Actual locations and implementation priorities may change as the design and implementation process progresses.

Station:	**Street location:**	**Transit connections**	**Type**
Cleveland - NCTC	W.3rd-E.9th Sts.	LRT, buses	
E.Cleveland/Bratenahl	E.105th St.	Buses	P
Euclid	E.260th St.		P
West End (Wickliffe, Willowick)	E.305th St./Rush Rd.		P
Willoughby / Eastlake	SR 306		P
Mentor	SR 615		P
W. Painesville	SR 44		P
Painesville	State St.		T,P
Madison	SR 528/Lake St.		T,P
Geneva	Broadway		T,P
W. Ashtabula	SR 45		P
Ashtabula	Station Ave./Lake Ave.		T,P
Conneaut	Mill St.		T,P

T=town center; P=park and ride available.

NEORAIL STUDY Phase II
LOGICAL INCREMENTS OF COMMUTER RAIL SERVICE, BY CORRIDOR

	Level of Service	Service End Points	Pk. Trains to Cleve.	Rev.-Peak 1-way trns.	Off-Peak 1-way trns.	Daily 1-way trns.	Daily Round Trips	Peak Headway	Off-Peak Headway	Route Miles	1-way Run Time (mins)	Average Speed (mph)	Req'd Meets (# of sidings)	Trainsets Required	Daily commuter train operations over congested freight territory	Remarks
1	**Lake West**															
1.1	LOS 1	Cleve- Lorain	3	0	0	3	6	45m	None	26.6	45	39	0	3	6 daily xings of Cuy R.	
1.2	LOS 2	Cleve- Lorain	4	1	1	6	12	35m	n.a.	26.6	45	39	2	3	12 daily xings of Cuy R.	
1.3	LOS 3	Cleve- Lorain	5	4	3	12	24	35m	120m	26.6	45	39	2	3	24 daily xings of Cuy R.	
2	**West**															
2.1	LOS 1	Cleve- Elyria	3	0	0	3	6	45m	None	25.6	43	37	0	3	6 daily xings of Cuy R.	
2.2	LOS 2	Cleve- Elyria	4	1	1	6	12	35m	n.a.	25.6	43	37	2	3	12 daily xings of Cuy R.	
2.3	LOS 2	Cleve- Amherst	4	1	1	6	12	35m	n.a.	31.8	52	37	3	4	12 daily xings of Cuy R.	
2.4	LOS 3	Cleve- Amherst	5	4	3	12	24	35m	120m	31.8	52	37	3	4	24 daily xings of Cuy R.	
3	**SOUTHWEST**															
3.1	LOS 1	Cleve- Medina via Rockport	3	0	0	3	6	45m	None	35.5	60	36	0	3	6 daily xings of Cuy R.	
3.2	LOS 2	Cleve- Medina via Rockport	4	1	1	6	12	35m	n.a.	35.5	60	36	3	4	12 daily xings of Cuy R.	
3.3	LOS 2	Cleve- Medina via I-71	4	1	1	6	12	35m	n.a.	34.0	56	36	3	4	12 daily xings of Cuy R.	
3.4	LOS 2	Cleve- Medina via Fairgrounds	4	1	1	6	12	35m	n.a.	34.2	56	37	3	4	12 daily xings of Cuy R.	
3.5	LOS 3	Cleve- Medina via Rockport	5	4	3	12	24	35m	120m	35.5	60	36	3	4	24 daily xings of Cuy R.	
3.6	LOS 3	Cleve- Medina via I-71	5	4	3	12	24	35m	120m	34.0	56	36	3	4	24 daily xings of Cuy R.	
3.7	LOS 3	Cleve- Medina via Fairgrounds	5	4	3	12	24	35m	120m	34.2	56	37	3	4	24 daily xings of Cuy R.	
4D	**SOUTH via Hudson**															
4D.1	LOS 1	Cleve- Cuyahoga Falls	3	0	0	3	6	45m	None	32.9	56	35	0	3	6 daily trains @ Euclid Av.	
4D.2	LOS 2	Cleve- Cuyahoga Falls	4	1	1	6	12	45m	None	32.9	56	35	2	3	8 daily trains @ Euclid Av.	
4D.3	LOS 2	Cleve- Akron	4	1	1	6	12	45m	None	37.9	65	35	2	3	8 daily trains @ Euclid Av.	
4D.4	LOS 2	Cleve- Akron-Canton	4	1	1	6	12	45m	None	62.2	130	29	2	3	8 daily trains @ Euclid Av.	
4D.5	LOS 3	Cleve- Akron	6	2	3	11	22	35m	120m	37.9	65	35	3	5	22 daily trains @ Euclid Av.	
4D.6	LOS 3	Cleve- Akron-Canton	6	2	3	11	22	35m	120m	62.2	130	29	3	6	22 daily trains @ Euclid Av.	
4E	**SOUTH via Kent**															
4E.1	LOS 1	Cleve- Kent (W&LE station)	3	0	0	3	6	45m	None	35.0	65	32	0	3	6 daily trains @ Euclid Av.	
4E.1	LOS 1	Cleve- Kent (Erie downtown sta.)	3	0	0	3	6	45m	None	36.1	76	29	0	3	6 daily trains @ Euclid Av.	
4E.2	LOS 2	Cleve- Kent (Erie downtown sta.)	4	1	1	6	12	45m	None	36.1	76	29	2	3	8 daily trains @ Euclid Av.	
4E.3	LOS 2	Cleve- Akron (via Plum Jct.)	4	1	1	6	12	45m	None	46.0	96	29	3	4	8 daily trains @ Euclid Av.	
4E.4	LOS 2	Cleve- Akron (via Brady Lake)	4	1	1	6	12	45m	None	47.8	87	33	3	4	8 daily trains @ Euclid Av.	
4E.5	LOS 3	Cleve- Kent	6	2	3	11	22	35m	120m	35.0	65	32	3	4	22 daily trains @ Euclid Av.	
4E.6	LOS 3	Cleve- Akron (via Plum Jct.)	6	2	3	11	22	35m	120m	44.9	85	32	3	5	22 daily trains @ Euclid Av.	
4E.7	LOS 3	Cleve- Akron (via Brady Lake)	6	2	3	11	22	35m	120m	47.8	87	33	3	5	22 daily trains @ Euclid Av.	

NEORAIL STUDY Phase II
LOGICAL INCREMENTS OF COMMUTER RAIL SERVICE, BY CORRIDOR

	Level of Service	Service End Points	Pk. Trains to Cleve.	Rev.-Peak 1-way trns.	Off-Peak 1-way trns.	Daily 1-way trns.	Daily Round Trips	Peak Headway	Off-Peak Headway	Route Miles	1-way Run Time (mins)	Average Speed (mph)	Req'd Meets (# of sidings)	Trainsets Required	Daily commuter train operations over congested freight territory	Remarks
6	**EAST**															
6.1	LOS 1	Cleve- Aurora	3	0	0	3	6	45m	None	24.9	45	39	0	3	6 daily trains @ Euclid Av.	
6.2	LOS 2	Cleve- Aurora	4	1	1	6	12	35m	n.a.	24.9	45	39	2	3	12 daily trains @ Euclid Av.	
6.3	LOS 3	Cleve- Aurora	5	4	3	12	24	35m	120m	24.9	45	39	2	3	24 daily trains @ Euclid Av.	
7	**LAKE EAST**															
7.1	LOS 1	Cleve- Painesville	3	0	0	3	6	45m	None	28.1	40	42	0	3	6 daily trains @ C'wood.	
7.2	LOS 1	Cleve- Painesville, w/	3	0	0	3	6	45m	None	28.1	40	42	0	3	6 daily trains @ C'wood.	
		2 peak Conneaut trains								67.2	90	45	0	3		
7.3	LOS 2	Cleve- Painesville	4	1	1	6	12	35m	n.a.	28.1	40	42	2	3	12 daily trains @ C'wood.	
7.4	LOS 2	Cleve- Madison, w/	4	1	1	6	12	35m	n.a.	38.9	55	43	3	4	12 daily trains @ C'wood.	
		2 peak Conneaut trains											3	4		
7.5	LOS 3	Cleve- Madison, w/	5	4	3	12	24	35m	120m	38.9	55	43	3	4	24 daily trains @ C'wood.	
		2 peak Conneaut trains								67.2	90	45	3	4		

NEO RAIL ROUTE 1

LAKE WEST CORRIDOR

Service Option
1

WEEKDAYS
EASTBOUND

TRAIN NUMBERS			100	102	104
Read Down ↓	Mileage		A.M.	A.M.	A.M.
Lorain	0.0	**Dep.**	**6:00**	**6:45**	**7:45**
Sheffield	4.0	Dep.	6:08	6:53	7:53
Avon	9.3	Dep.	6:16	7:01	8:01
Westlake / Bay Village	15.6	Dep.	6:25	7:10	8:10
Rocky River	18.8	Dep.	6:31	7:16	8:16
Lakewood	20.8	Dep.	6:36	7:21	8:21
Cleveland - North Coast	26.6	**Arr.**	**6:46**	**7:31**	**8:31**
			A.M.	A.M.	A.M.

WESTBOUND

TRAIN NUMBERS			101	103	105
Read Down ↓	Mileage		P.M.	P.M.	P.M.
Cleveland - North Coast	0.0	**Dep.**	**4:15**	**5:05**	**6:00**
Lakewood	5.8	Dep.	4:26	5:16	6:11
Rocky River	7.8	Dep.	4:31	5:21	6:16
Westlake / Bay Village	11.0	Dep.	4:37	5:27	6:22
Avon	17.3	Dep.	4:45	5:35	6:30
Sheffield	22.6	Dep.	4:54	5:44	6:39
Lorain	26.6	**Arr.**	**5:01**	**5:51**	**6:46**
			P.M.	P.M.	P.M.

Estimated Performance in year 2025
Level of Service Option 1:
Rush hour service to Cleveland only -- 3 daily round trips.

Daily ridership (trips): 1,600
Capital cost (2001 dollars): $107 million

NEO RAIL ROUTE 1

LAKE WEST CORRIDOR

Service Option
2

WEEKDAYS
EASTBOUND

TRAIN NUMBERS		100	102	104	106	108	110
Read Down ↓		A.M.	A.M.	A.M.	A.M.	P.M.	P.M.
Lorain	**Dep.**	**6:00**	**6:45**	**7:15**	**7:55**	**1:00**	**5:00**
Sheffield	Dep.	6:08	6:53	7:23	8:03	1:08	5:08
Avon	Dep.	6:16	7:01	7:31	8:11	1:16	5:16
Westlake / Bay Village	Dep.	6:25	7:10	7:40	8:20	1:25	5:25
Rocky River	Dep.	6:31	7:16	7:46	8:26	1:31	5:31
Lakewood	Dep.	6:36	7:21	7:51	8:31	1:36	5:36
Cleveland - North Coast	**Arr.**	**6:46**	**7:31**	**8:01**	**8:41**	**1:46**	**5:46**
		A.M.	A.M.	A.M.	A.M.	P.M.	P.M.

WESTBOUND

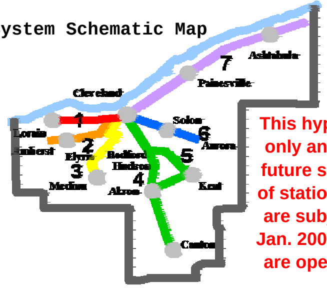
TRAIN NUMBERS		101	103	105	107	109	111
Read Down ↓		A.M.	P.M.	P.M.	P.M.	P.M.	P.M.
Cleveland - North Coast	**Dep.**	**6:55**	**12:01**	**4:00**	**4:35**	**5:05**	**6:00**
Lakewood	Dep.	7:06	12:12	4:11	4:46	5:16	6:11
Rocky River	Dep.	7:11	12:17	4:16	4:51	5:21	6:16
Westlake / Bay Village	Dep.	7:17	12:23	4:22	4:57	5:27	6:22
Avon	Dep.	7:25	12:31	4:30	5:05	5:35	6:30
Sheffield	Dep.	7:34	12:40	4:39	5:14	5:44	6:39
Lorain	**Arr.**	**7:41**	**12:47**	**4:46**	**5:21**	**5:51**	6:46
		A.M.	A.M.	A.M.	A.M.	A.M.	P.M.

Estimated Performance in year 2025
Level of Service Option 2:
Rush hour and limited off-peak service -- 6 daily round trips.

Daily ridership (trips): 2,400
Capital cost (2001 dollars): $174 million

NEO RAIL
NORTHEAST OHIO
COMMUTER RAIL

System Schematic Map



Disclaimer:
This hypothetical timetable is only an example of potential future service. The locations of stations and times of trains are subject to change. As of Jan. 2001, no commuter trains are operating on these lines.

Facts & Figures

Route 1 ● Lake West Corridor

Total length of route is 27 miles. New track connection is required at Alcott between the NS Nickel Plate Line and the NS Chicago Line.

Service of more than 12 daily trains requires a new lift bridge across the Cuyahotga River.

Service subject to negotiated agreement w/ freight railroad right-of-way owners.

Sample Fares to Cleveland

	One-way	Monthly
Lakewood	#REF!	#REF!
Rocky River	#REF!	#REF!
Westlake / Bay Village	#REF!	#REF!
Avon	#REF!	#REF!
Sheffield	#REF!	#REF!
Lorain	#REF!	#REF!

Would you ride any of these trains?
If so (or if not), please fill out a questionnaire form telling us which trains you'd ride, and whether you would use the service for trips to work, school, sporting or other special events or other purposes.
Or, contact us at the study's web site: **www.pb4d.com/neorail**

NEORail Study Phase II Northeast Ohio Commuter Rail Feasibility Study
Northeast Ohio Commuter Rail Feasibility Study

NEO RAIL
NORTHEAST OHIO
COMMUTER RAIL

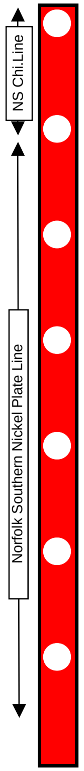
ROUTE
1
LAKE WEST
CORRRIDOR

Cleveland
Lakewood
Avon
Lorain

Serving Cuyahoga and Lorain Counties

Historic Route of the Nickel Plate Road

HYPOTHETICAL TIMETABLE



Cleveland-North Coast

Lakewood

Rocky River

Westlake/Bay Village

Avon

Sheffield

Lorain

Example Only

NEO RAIL ROUTE 1 -- LAKE WEST CORRIDOR

LEVEL OF SERVICE 3 -- 12 Daily Round Trips

Service Option **3**

WEEKDAYS
EASTBOUND

Read Down ↓	Location	Mileage		100	102	104	106	108	110	112	114	401	116	118	120
			TRAIN NUMBERS	A.M.	A.M.	A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.
Lorain -- Grove Site	US 6 & Broadway	0.0	**Dep.**	**6:05**	**6:40**	**7:15**	**7:50**	**8:25**	**10:00**	**11:40**	**2:05**	**3:20**	**4:15**	**4:55**	**6:45**
Sheffield	Lake Breeze Road	4.0	Dep.	6:13	6:48	7:23	7:58	8:33	10:08	11:48	2:13	3:28	4:23	5:03	6:53
Avon	SR 83	9.3	Dep.	6:21	6:56	7:31	8:06	8:41	10:16	11:56	2:21	3:36	4:31	5:11	7:01
Westlake / Bay Village	Columbia Road	15.6	Dep.	6:30	7:05	7:40	8:15	8:50	10:25	12:05	2:30	3:45	4:40	5:20	7:10
Rocky River	Nickel Plate rail sta	18.8	Dep.	6:36	7:11	7:46	8:21	8:56	10:31	12:11	2:36	3:51	4:46	5:26	7:16
Lakewood	St. Charles Ave.	20.8	Dep.	6:41	7:16	7:51	8:26	9:01	10:36	12:16	2:41	3:56	4:51	5:31	7:21
Cleveland - North Coast	North Coast Transp. C	26.6	**Arr.**	6:51	7:26	8:01	8:36	9:11	10:46	12:26	2:51	4:06	5:01	5:41	7:31
	W.3rd to E.9th Sts.			A.M.	A.M.	A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.

WESTBOUND

Read Down ↓	Mileage	TRAIN NUMBERS	101	103	105	107	109	111	113	115	117	119	121	123	125
			A.M.	A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.
Cleveland - North Coast	0.0	**Dep.**	**6:55**	**7:30**	**8:05**	**8:40**	**10:05**	**12:35**	**2:10**	**4:00**	**4:35**	**5:10**	**5:45**	**7:55**	**11:00**
Lakewood	5.8	Dep.	7:06	7:41	8:16	8:51	10:16	12:46	2:21	4:11	4:46	5:21	5:56	8:06	11:11
Rocky River	7.8	Dep.	7:11	7:46	8:21	8:56	10:21	12:51	2:26	4:16	4:51	5:26	6:01	8:11	11:16
Westlake / Bay Village	11.0	Dep.	7:17	7:52	8:27	9:02	10:27	12:57	2:32	4:22	4:57	5:32	6:07	8:17	11:22
Avon	17.3	Dep.	7:25	8:00	8:35	9:10	10:35	13:05	2:40	4:30	5:05	5:40	6:15	8:25	11:30
Sheffield	22.6	Dep.	7:34	8:09	8:44	9:19	10:44	13:14	2:49	4:39	5:14	5:49	6:24	8:34	11:39
Lorain -- Grove Site	26.6	**Arr.**	**7:41**	**8:16**	**8:51**	**9:26**	**10:51**	**13:21**	**2:56**	**4:46**	**5:21**	**5:56**	**6:31**	**8:41**	**11:46**
			A.M.	P.M.	P.M.	P.M.	P.M.	P.M.	A.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.

Estimated Performance in year 2025
Level of Service Option 3:
Full service -- rush hour to Cleveland, reverse peak and bi-hourly off-peak -- 24 daily round trips.
Requires 3 trainsets to operate this service to Aurora, 4 to Mantua.

Daily ridership (trips): 3,600
Capital cost (2001 dollars): $258 million

NEO RAIL ROUTE 1 -- LAKE WEST CORRIDOR

LEVEL OF SERVICE 3 -- 8 Daily Round Trips on Weekends

Service Option **3**

SATURDAYS, SUNDAYS AND HOLIDAYS
EASTBOUND

Read Down ↓	TRAIN NUMBERS	150	152	154	156	158	160	162	415
		A.M.	A.M.	A.M.	P.M.	P.M.	P.M.	P.M.	P.M.
Lorain	**Dep.**	**7:46**	**9:46**	**11:46**	**1:46**	**3:46**	**5:46**	**7:46**	**9:46**
Sheffield	Dep.	7:54	9:54	11:54	1:54	3:54	5:54	7:54	9:54
Avon	Dep.	8:02	10:02	12:02	2:02	4:02	6:02	8:02	10:02
Westlake / Bay Village	Dep.	8:11	10:11	12:11	2:11	4:11	6:11	8:11	10:11
Rocky River	Dep.	8:17	10:17	12:17	2:17	4:17	6:17	8:17	10:17
Lakewood	Dep.	8:22	10:22	12:22	2:22	4:22	6:22	8:22	10:22
Cleveland - North Coast	**Arr.**	**8:32**	**10:32**	**12:32**	**2:32**	**4:32**	**6:32**	**8:32**	**10:32**
		A.M.	A.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.

WESTBOUND

Read Down ↓	TRAIN NUMBERS	151	153	155	157	159	161	163	165
		A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M.	P.M.
Cleveland - North Coast	**Dep.**	**8:00**	**10:00**	**12:00**	**2:00**	**4:00**	**6:00**	**8:00**	**11:00**
Lakewood	Dep.	8:11	10:11	12:11	2:11	4:11	6:11	8:11	11:11
Rocky River	Dep.	8:16	10:16	12:16	2:16	4:16	6:16	8:16	11:16
Westlake / Bay Village	Dep.	8:22	10:22	12:22	2:22	4:22	6:22	8:22	11:22
Avon	Dep.	8:30	10:30	12:30	2:30	4:30	6:30	8:30	11:30
Sheffield	Dep.	8:39	10:39	12:39	2:39	4:39	6:39	8:39	11:39
Lorain	**Arr.**	**8:46**	**10:46**	**12:46**	**2:46**	**4:46**	**6:46**	**8:46**	**11:46**
		A.M.	A.M.	A.M.	P.M.	P.M.	P.M.	P.M.	A.M.

Example Only

NEO RAIL ROUTE 2
WEST CORRIDOR

Service Option
1

WEEKDAYS
EASTBOUND

TRAIN NUMBERS Read Down ↓	Mileage		200	202	204
			A.M.	A.M.	A.M.
Amherst	0.0	**Dep.**	**6:07**	**6:50**	**7:40**
Elyria	10.7	Dep.	6:15	6:58	7:48
North Ridgeville	15.3	Dep.	6:20	7:03	7:53
Olmsted Falls	18.2	Dep.	6:25	7:08	7:58
Berea	19.5	Dep.	6:30	7:13	8:03
Hopkins Airport	22.3	Dep.	6:35	7:18	8:08
Cleveland - North Coast	31.6	**Arr.**	**6:51**	**7:34**	**8:24**
			A.M.	A.M.	A.M.

WESTBOUND

TRAIN NUMBERS Read Down ↓	Mileage		201	203	205
			P.M.	P.M.	P.M.
Cleveland - North Coast	0.0	**Dep.**	**4:40**	**5:30**	**6:25**
Hopkins Airport	9.3	Dep.	4:56	5:46	6:41
Berea	12.1	Dep.	5:01	5:51	6:46
Olmsted Falls	13.4	Dep.	5:05	5:55	6:50
North Ridgeville	16.3	Dep.	5:11	6:01	6:56
Elyria	20.9	Dep.	5:17	6:07	7:02
Amherst	31.6	**Arr.**	**5:30**	**6:20**	**7:15**
			P.M.	P.M.	P.M.

Estimated Performance in year 2025
Level of Service Option 1:
Rush hour service to Cleveland only -- 3 daily round trips.

Daily ridership (trips): 900 to Elyria only.
Capital cost (2001 dollars): $203 to Elyria

NEO RAIL ROUTE 2
WEST CORRIDOR

Service Option
2

WEEKDAYS
EASTBOUND

TRAIN NUMBERS Read Down ↓		200	202	204	206	208	210
		A.M.	A.M.	A.M.	A.M.	P.M.	P.M.
Amherst	**Dep.**	**6:07**	**6:30**	**7:05**	-	**1:07**	-
Elyria	Dep.	6:15	6:38	7:13	**8:00**	1:15	**5:05**
North Ridgeville	Dep.	6:20	6:43	7:18	8:05	1:20	5:10
Olmsted Falls	Dep.	6:25	6:48	7:23	8:10	1:25	5:15
Berea	Dep.	6:30	6:53	7:28	8:15	1:30	5:20
Hopkins Airport	Dep.	6:35	6:58	7:33	8:20	1:35	5:25
Cleveland - North Coast	**Arr.**	**6:51**	**7:14**	**7:49**	**8:36**	**1:51**	**5:41**
		A.M.	A.M.	A.M.	A.M.	P.M.	P.M.

WESTBOUND

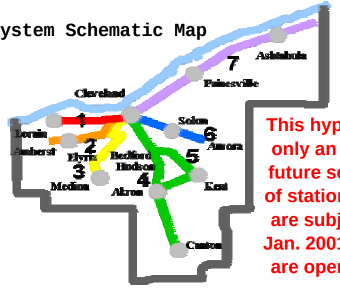
TRAIN NUMBERS Read Down ↓		201	203	205	207	209	211
		A.M.	P.M.	P.M.	P.M.	P.M.	P.M.
Cleveland - North Coast	**Dep.**	**7:07**	**12:25**	**4:20**	**4:55**	**5:30**	**6:25**
Hopkins Airport	Dep.	7:23	12:41	4:36	5:11	5:46	6:41
Berea	Dep.	7:28	12:46	4:41	5:16	5:51	6:46
Olmsted Falls	Dep.	7:32	12:50	4:45	5:20	5:55	6:50
North Ridgeville	Dep.	7:38	12:56	4:51	5:26	6:01	6:56
Elyria	Dep.	7:44	1:02	4:57	5:32	6:07	7:02
Amherst	**Arr.**	-	**1:15**	-	**5:45**	**6:20**	**7:15**
		A.M.	A.M.	A.M.	A.M.	A.M.	P.M.

Estimated Performance in year 2025
Level of Service Option 2:
Rush hour and limited off-peak service -- 6 daily round trips.

Daily ridership (trips): 1,700
Capital cost (2001 dollars): $410 million

NEO RAIL NORTHEAST OHIO COMMUTER RAIL

System Schematic Map



Disclaimer:
This hypothetical timetable is only an example of potential future service. The locations of stations and times of trains are subject to change. As of Jan. 2001, no commuter trains are operating on these lines.

Facts & Figures
Route 2 ● West Corridor

Total length of route is 32 miles, mostly along right-of-way that used to be the 4-track mainline of the New York Central.

Service of more than 6 daily trains requires a new lift bridge across the Cuyahoga River and major new track construction between downtown Cleveland at Hopkins Airport.

Sample Fares to Cleveland	One-way	Monthly
Hopkins Airport	#REF!	#REF!
Berea	#REF!	#REF!
Olmsted Falls	#REF!	#REF!
North Ridgeville	#REF!	#REF!
Elyria	#REF!	#REF!
Amherst	#REF!	#REF!

Proposed high-speed intercity service to Toledo and Chicago would follow this route and would potentially share required capital costs.
Proposed high-speed intercity service to Columbus and Cincinnati (the 3-C corridor) also would follow this route as far as Berea.

Service subject to negotiated agreement w/ freight railroad right-of-way owners.

Would you ride any of these trains?
If so (or if not), please fill out a questionnaire form telling us which trains you'd ride, and whether you would use the service for trips to work, school, sporting or other special events or other purposes.
Or, contact us at the study's web site: **www.pb4d.com/neorail**

NEORail Study Phase II Northeast Ohio Commuter Rail Feasibility Study
Northeast Ohio Commuter Rail Feasibility Study

NEO RAIL NORTHEAST OHIO COMMUTER RAIL

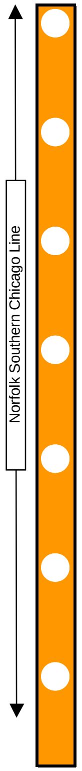
ROUTE
2
WEST
CORRRIDOR

Cleveland
Hopkins Airport
Elyria
Amherst

Serving Cuyahoga and Lorain Counties

Historic Route of the New York Central Railroad

HYPOTHETICAL TIMETABLE



Cleveland-North Coast

Cleveland Hopkins International Airport

Berea

Olmsted Falls

North Ridgeville

Elyria

Amherst

Example Only

NEO RAIL ROUTE 2 -- WEST CORRIDOR

LEVEL OF SERVICE 3 -- 12 Daily Round Trips

Service Option **3**

WEEKDAYS
EASTBOUND

Read Down ↓	Location	Mileage		200	202	204	206	208	210	212	214	401	216	218	220
	TRAIN NUMBERS			A.M.	A.M.	A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.
Amherst	SR 58 & Ohio Turnpike	0.0	**Dep.**	**6:00**	**6:35**	**7:10**	**7:35**	**8:10**	**10:00**	**12:01**	**2:00**	**3:50**	**4:25**	**5:15**	**7:45**
Elyria	East Street	10.7	Dep.	6:08	6:43	7:18	7:43	8:18	10:08	12:09	2:08	3:58	4:33	5:23	7:53
North Ridgeville	SR 10	15.3	Dep.	6:13	6:48	7:23	7:48	8:23	10:13	12:14	2:13	4:03	4:38	5:28	7:58
Olmsted Falls	Depot Street	18.2	Dep.	6:18	6:53	7:28	7:53	8:28	10:18	12:19	2:18	4:08	4:43	5:33	8:03
Berea	Front Street	19.5	Dep.	6:23	6:58	7:33	7:58	8:33	10:23	12:24	2:23	4:13	4:48	5:38	8:08
Hopkins Airport	Airport Terminal	22.3	Dep.	6:28	7:03	7:38	8:03	8:38	10:28	12:29	2:28	4:18	4:53	5:43	8:13
Cleveland - North Coast	North Coast Transp. C W.3rd to E.9th Sts.	31.6	**Arr.**	6:44	7:19	7:54	8:19	8:54	10:44	12:45	2:44	4:34	5:09	5:59	8:29
				A.M.	A.M.	A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.

WESTBOUND

Read Down ↓	Mileage		201	203	205	207	209	211	213	215	217	219	221	223	225
TRAIN NUMBERS			A.M.	A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.
Cleveland - North Coast	0.0	**Dep.**	**7:10**	**7:40**	**8:35**	**11:00**	**1:00**	**3:00**	**4:10**	**4:45**	**5:20**	**5:55**	**6:45**	**8:45**	**11:00**
Hopkins Airport	9.3	Dep.	7:26	7:56	8:51	11:16	1:16	3:16	4:26	5:01	5:36	6:11	7:01	9:01	11:16
Berea	12.1	Dep.	7:31	8:01	8:56	11:21	1:21	3:21	4:31	5:06	5:41	6:16	7:06	9:06	11:21
Olmsted Falls	13.4	Dep.	7:35	8:05	9:00	11:25	1:25	3:25	4:35	5:10	5:45	6:20	7:10	9:10	11:25
North Ridgeville	16.3	Dep.	7:41	8:11	9:06	11:31	1:31	3:31	4:41	5:16	5:51	6:26	7:16	9:16	11:31
Elyria	20.9	Dep.	7:47	8:17	9:12	11:37	1:37	3:37	4:47	5:22	5:57	6:32	7:22	9:22	11:37
Amherst	31.6	**Arr.**	**8:00**	**8:30**	**9:25**	**11:50**	**1:50**	**3:50**	**5:00**	**5:35**	**6:10**	**6:45**	**7:35**	**9:35**	**11:50**
			A.M.	P.M.	P.M.	P.M.	P.M.	P.M.	A.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.

Estimated Performance in year 2025

Level of Service Option 3:
Full service -- rush hour to Cleveland, reverse peak and bi-hourly off-peak -- 24 daily round trips.
4 trainsets are required to operate this service.

Daily ridership (trips): 3,100
Capital cost (2001 dollars): $557 million

NEO RAIL ROUTE 2 -- WEST CORRIDOR

LEVEL OF SERVICE 3 -- 8 Daily Round Trips on Weekends

Service Option **3**

SATURDAYS, SUNDAYS AND HOLIDAYS
EASTBOUND

Read Down ↓	TRAIN NUMBERS	250	252	254	256	258	260	262	415
		A.M.	A.M.	A.M.	P.M.	P.M.	P.M.	P.M.	P.M.
Amherst	**Dep.**	**8:00**	**10:00**	**12:00**	**2:00**	**4:00**	**6:00**	**8:00**	**10:00**
Elyria	Dep.	8:08	10:08	12:08	2:08	4:08	6:08	8:08	10:08
North Ridgeville	Dep.	8:13	10:13	12:13	2:13	4:13	6:13	8:13	10:13
Olmsted Falls	Dep.	8:18	10:18	12:18	2:18	4:18	6:18	8:18	10:18
Berea	Dep.	8:23	10:23	12:23	2:23	4:23	6:23	8:23	10:23
Hopkins Airport	Dep.	8:28	10:28	12:28	2:28	4:28	6:28	8:28	10:28
Cleveland - North Coast	**Arr.**	**8:44**	**10:44**	**12:44**	**2:44**	**4:44**	**6:44**	**8:44**	**10:44**
		A.M.	A.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.

WESTBOUND

Read Down ↓	TRAIN NUMBERS	251	253	255	257	259	261	263	265
		A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M.	P.M.
Cleveland - North Coast	**Dep.**	**8:00**	**10:00**	**12:00**	**2:00**	**4:00**	**6:00**	**8:00**	**11:00**
Hopkins Airport	Dep.	8:16	10:16	12:16	2:16	4:16	6:16	8:16	11:16
Berea	Dep.	8:21	10:21	12:21	2:21	4:21	6:21	8:21	11:21
Olmsted Falls	Dep.	8:25	10:25	12:25	2:25	4:25	6:25	8:25	11:25
North Ridgeville	Dep.	8:31	10:31	12:31	2:31	4:31	6:31	8:31	11:31
Elyria	Dep.	8:37	10:37	12:37	2:37	4:37	6:37	8:37	11:37
Amherst	**Arr.**	**8:50**	**10:50**	**12:50**	**2:50**	**4:50**	**6:50**	**8:50**	**11:50**
		A.M.	A.M.	A.M.	P.M.	P.M.	P.M.	P.M.	A.M.

Example Only

NEO *RAIL ROUTE 3*

SOUTHWEST CORRIDOR

Service Option 1

WEEKDAYS
EASTBOUND

Read Down ↓	Mileage	TRAIN NUMBERS	300	302	304
			A.M.	A.M.	A.M.
Medina	0.0	**Dep.**	**6:00**	**6:45**	**7:35**
Lester	3.3	Dep.	6:08	6:53	7:43
Brunswick	9.6	Dep.	6:17	7:02	7:52
Strongsville	15.8	Dep.	6:25	7:10	8:00
Fairgrounds	20.7	Dep.	6:34	7:19	8:09
Hopkins Airport	23.5	Dep.	6:39	7:24	8:14
Cleveland - North Coast	32.8	**Arr.**	**6:56**	**7:41**	**8:31**
			A.M.	A.M.	A.M.

WESTBOUND

Read Down ↓	Mileage	TRAIN NUMBERS	301	303	305
			P.M.	P.M.	P.M.
Cleveland - North Coast	0.0	**Dep.**	**4:30**	**5:15**	**6:15**
Hopkins Airport	9.3	Dep.	4:46	5:31	6:31
Fairgrounds	12.1	Dep.	4:51	5:36	6:36
Strongsville	17.0	Dep.	5:02	5:47	6:47
Brunswick	23.2	Dep.	5:11	5:56	6:56
Lester	29.5	Dep.	5:20	6:05	7:05
Medina	32.8	**Arr.**	**5:27**	**6:12**	**7:12**
			P.M.	P.M.	P.M.

Estimated Performance in year 2025
Level of Service Option 1:
Rush hour service to Cleveland only -- 3 daily round trips.

Daily ridership (trips): 600
Capital cost (2001 dollars): $231 million

NEO *RAIL ROUTE 3*

SOUTHWEST CORRIDOR

Service Option 2

WEEKDAYS
EASTBOUND

Read Down ↓		TRAIN NUMBERS	300	302	304	306	308	310
			A.M.	A.M.	A.M.	A.M.	P.M.	P.M.
Medina		**Dep.**	**6:00**	**6:30**	**7:20**	**8:20**	**1:05**	**5:00**
Lester		Dep.	6:08	6:38	7:28	8:28	1:13	5:08
Brunswick		Dep.	6:17	6:47	7:37	8:37	1:22	5:17
Strongsville		Dep.	6:25	6:55	7:45	8:45	1:30	5:25
Fairgrounds		Dep.	6:34	7:04	7:54	8:54	1:39	5:34
Hopkins Airport		Dep.	6:39	7:09	7:59	8:59	1:44	5:39
Cleveland - North Coast		**Arr.**	**6:56**	**7:26**	**8:16**	**9:16**	**2:01**	**5:56**
			A.M.	A.M.	A.M.	A.M.	P.M.	P.M.

WESTBOUND

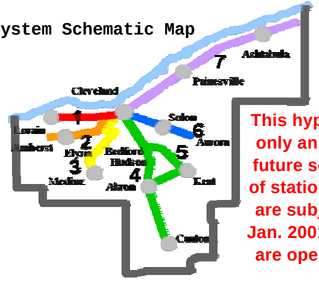
Read Down ↓		TRAIN NUMBERS	301	303	305	307	309	311
			A.M.	P.M.	P.M.	P.M.	P.M.	P.M.
Cleveland - North Coast		**Dep.**	**7:15**	**12:01**	**3:55**	**4:40**	**5:15**	**6:15**
Hopkins Airport		Dep.	7:31	12:17	4:11	4:56	5:31	6:31
Fairgrounds		Dep.	7:36	12:22	4:16	5:01	5:36	6:36
Strongsville		Dep.	7:47	12:33	4:27	5:12	5:47	6:47
Brunswick		Dep.	7:56	12:42	4:36	5:21	5:56	6:56
Lester		Dep.	8:05	12:51	4:45	5:30	6:05	7:05
Medina		**Arr.**	**8:12**	**12:58**	**4:52**	**5:37**	**6:12**	7:12
			A.M.	P.M.	P.M.	P.M.	P.M.	P.M.

Estimated Performance in year 2025
Level of Service Option 2:
Rush hour and limited off-peak service -- 6 daily round trips.

Daily ridership (trips): 1,400
Capital cost (2001 dollars): $381 million

NEO RAIL
NORTHEAST OHIO
COMMUTER RAIL

System Schematic Map



Disclaimer:
This hypothetical timetable is only an example of potential future service. The locations of stations and times of trains are subject to change. As of Jan. 2001, no commuter trains are operating on these lines.

Facts & Figures
Route 3 ● Southwest Corridor

Total length of route is 33 miles. A new 3-mile track connection is required to connect the CSX Medina Line to the NS Chicago Line. Three alternative alignments are possible.

The routing via Hopkins Airport and the Cuy.Co. Fairgrounds is shown in this table. Service of more than 6 daily trains requires a new lift bridge across the Cuyahoga River and major new track construction between downtown Cleveland at Hopkins Airport.

Sample Fares to Cleveland

	One-way	Monthly
Hopkins Airport	#REF!	#REF!
Fairgrounds	#REF!	#REF!
Strongsville	#REF!	#REF!
Brunswick	#REF!	#REF!
Lester	#REF!	#REF!
Medina	#REF!	#REF!

Proposed high-speed intrercity service to Toledo and Chicago and to Columbus and Cincinnati (the 3-C corridor) also would follow this route as far as Berea.

Service subject to negotiated agreement w/ freight railroad right-of-way owners (NS and CSX).

Would you ride any of these trains?
If so (or if not), please fill out a questionnaire form telling us which trains you'd ride, and whether you would use the service for trips to work, school, sporting or other special events or other purposes.
Or, contact us at the study's web site: **www.pb4d.com/neorail**

NEORail Study Phase II Northeast Ohio Commuter Rail Feasibility Study
Northeast Ohio Commuter Rail Feasibility Study

PB AMATS SCATS NOACA

NEO RAIL
NORTHEAST OHIO
COMMUTER RAIL

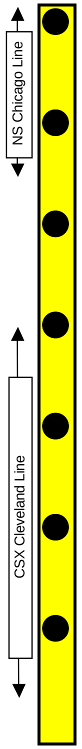
ROUTE
3
SOUTHWEST
CORRRIDOR

Cleveland
Hopkins Airport
Strongsville
Medina

Serving Cuyahoga and Medina Counties

Historic Route of the Baltimore & Ohio Railroad

HYPOTHETICAL TIMETABLE



Cleveland-North Coast

Cleveland Hopkins
International Airport

Cuyahoga County
Fairgrounds

Strongsville

Brunswick

Lester

Medina

Example Only

NEO RAIL ROUTE 3 -- SOUTHWEST CORRIDOR

LEVEL OF SERVICE 3 -- 12 Daily Round Trips

Service Option **3**

WEEKDAYS
NORTHBOUND/EASTBOUND

Read Down ↓	Location	Mileage TRAIN NUMBERS		300	302	304	306	308	310	312	314	401	316	318	320	423
				A.M.	A.M.	A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.
Medina	SR 18-Washington Stre	0.0	**Dep.**	**6:00**	**6:35**	**7:20**	**7:55**	**8:30**	**10:50**	**1:05**	**3:20**	**4:20**	**5:25**	**7:45**		
Lester	SR 57-Spieth Road	3.3	Dep.	6:08	6:43	7:28	8:03	8:38	10:58	1:13	3:28	4:28	5:33	7:53		
Brunswick	SR 303	9.6	Dep.	6:17	6:52	7:37	8:12	8:47	11:07	1:22	3:37	4:37	5:42	8:02		
Strongsville	SR 82	15.8	Dep.	6:25	7:00	7:45	8:20	8:55	11:15	1:30	3:45	4:45	5:50	8:10		
Cuyahoga Co. Fairgrounds	Bagley Road	20.7	Dep.	6:34	7:09	7:54	8:29	9:04	11:24	1:39	3:54	4:54	5:59	8:19		
Hopkins Airport	Airport Terminal	23.5	Dep.	6:39	7:14	7:59	8:34	9:09	11:29	1:44	3:59	4:59	6:04	8:24		
Cleveland - North Coast	North Coast Transp. C	32.8	**Arr.**	**6:56**	**7:31**	**8:16**	**8:51**	**9:26**	**11:46**	**2:01**	**4:16**	**5:16**	**6:21**	**8:41**		
	W.3rd to E.9th Sts.			A.M.	A.M.	A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.

SOUTHBOUND/WESTBOUND

Read Down ↓	Mileage TRAIN NUMBERS		301	303	305	307	309	311	313	315	317	319	321	323
			A.M.	A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.
Cleveland - North Coast	0.0	**Dep.**	**7:10**	**7:40**	**9:45**	**12:01**	**2:15**	**4:00**	**4:40**	**5:15**	**5:50**	**6:35**	**8:55**	**11:00**
Hopkins Airport	9.3	Dep.	7:26	7:56	10:01	12:17	2:31	4:16	4:56	5:31	6:06	6:51	9:11	11:16
Cuyahoga Co. Fairgrounds	12.1	Dep.	7:31	8:01	10:06	12:22	2:36	4:21	5:01	5:36	6:11	6:56	9:16	11:21
Strongsville	17.0	Dep.	7:42	8:12	10:17	12:33	2:47	4:32	5:12	5:47	6:22	7:07	9:27	11:32
Brunswick	23.2	Dep.	7:51	8:21	10:26	12:42	2:56	4:41	5:21	5:56	6:31	7:16	9:36	11:41
Lester	29.5	Dep.	8:00	8:30	10:35	12:51	3:05	4:50	5:30	6:05	6:40	7:25	9:45	11:50
Medina	32.8	**Arr.**	**8:07**	**8:37**	**10:42**	**12:58**	**3:12**	**4:57**	**5:37**	**6:12**	**6:47**	**7:32**	**9:52**	**11:57**
			A.M.	P.M.	P.M.	P.M.	P.M.	P.M.	A.M.	P.M.	P.M.	P.M.	P.M.	P.M.

Estimated Performance in year 2025
Level of Service Option 3:
Full service -- rush hour to Cleveland, reverse peak and bi-hourly off-peak -- 24 daily round trips.
4 trainsets are required to operate this service.

Daily ridership (trips): 2,500
Capital cost (2001 dollars): $394 million

NEO RAIL ROUTE 3 -- SOUTHWEST CORRIDOR

LEVEL OF SERVICE 3 -- 8 Daily Round Trips on Weekends

Service Option **3**

SATURDAYS, SUNDAYS AND HOLIDAYS
NORTHBOUND/EASTBOUND

Read Down ↓	TRAIN NUMBERS	350	352	354	356	358	360	362	415
		A.M.	A.M.	A.M.	P.M.	P.M.	P.M.	P.M.	P.M.
Medina	**Dep.**	**8:00**	**10:00**	**12:00**	**2:00**	**4:00**	**6:00**	**8:00**	**10:00**
Lester	Dep.	8:08	10:08	12:08	2:08	4:08	6:08	8:08	10:08
Brunswick	Dep.	8:17	10:17	12:17	2:17	4:17	6:17	8:17	10:17
Strongsville	Dep.	8:25	10:25	12:25	2:25	4:25	6:25	8:25	10:25
Fairgrounds	Dep.	8:34	10:34	12:34	2:34	4:34	6:34	8:34	10:34
Hopkins Airport	Dep.	8:39	10:39	12:39	2:39	4:39	6:39	8:39	10:39
Cleveland - North Coast	**Arr.**	**8:56**	**10:56**	**12:56**	**2:56**	**4:56**	**6:56**	**8:56**	**10:56**
		A.M.	A.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.

SOUTHBOUND/WESTBOUND

Read Down ↓	TRAIN NUMBERS	351	353	355	357	359	361	363	365
		A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M.	P.M.
Cleveland - North Coast	**Dep.**	**8:00**	**10:00**	**12:00**	**2:00**	**4:00**	**6:00**	**8:00**	**11:00**
Hopkins Airport	Dep.	8:16	10:16	12:16	2:16	4:16	6:16	8:16	11:16
Fairgrounds	Dep.	8:21	10:21	12:21	2:21	4:21	6:21	8:21	11:21
Strongsville	Dep.	8:32	10:32	12:32	2:32	4:32	6:32	8:32	11:32
Brunswick	Dep.	8:41	10:41	12:41	2:41	4:41	6:41	8:41	11:41
Lester	Dep.	8:50	10:50	12:50	2:50	4:50	6:50	8:50	11:50
Medina	**Arr.**	**8:57**	**10:57**	**12:57**	**2:57**	**4:57**	**6:57**	**8:57**	**11:57**
		A.M.	A.M.	A.M.	P.M.	P.M.	P.M.	P.M.	A.M.

Example Only

NEO RAIL ROUTE 4 -- SOUTH CORRIDOR

LEVEL OF SERVICE 1 -- 3 Peak Trips

Service Option **1**

WEEKDAYS
NORTHBOUND / WESTBOUND

TRAIN NUMBERS Read Down ↓	Mileage		401	403	405
			A.M.	A.M.	A.M.
Canton -- Tuscarawas St.	0.0	**Dep.**	-	**5:49**	**6:54**
Football Hall of Fame	1.5	Dep.	-	5:53	6:58
Belden Village / N. Canton	4.5	Dep.	-	5:59	7:04
Akron/Canton Airport	7.4	Dep.	-	6:05	7:10
Myersville / Uniontown	11.0	Dep.	-	6:13	7:18
South Akron	17.2	Dep.	-	6:20	7:25
Akron-Quaker Square	22.3	**Arr.**	-	**6:29**	**7:34**
		Dep.	**6:05**	**6:36**	**7:41**
Cuyahoga Falls	24.7	Dep.	6:15	6:46	7:51
Silver Lake	29.1	Dep.	6:20	6:51	7:56
Hudson	33.6	Dep.	6:28	6:59	8:04
Macedonia	36.2	Dep.	6:36	7:07	8:12
Northfield Pk./Walton Hills	42.1	Dep.	6:42	7:13	8:18
Bedford	46.1	Dep.	6:47	7:18	8:23
Garfield Heights	49.0	Dep.	6:52	7:23	8:28
E.88th St. / Union	54.6	Dep.	7:00	7:31	8:36
E.55th St. / Euclid	56.7	Dep.	7:05	7:36	8:41
Cleveland - North Coast	61.1	**Arr.**	**7:13**	**7:44**	**8:49**
			A.M.	A.M.	A.M.

SOUTHBOUND / EASTBOUND

TRAIN NUMBERS Read Down ↓	Mileage		400	402	404
			P.M.	P.M.	P.M.
Cleveland - North Coast	0.0	**Dep.**	**4:05**	**4:55**	**6:05**
E.55th St. / Euclid	4.4	Dep.	4:13	5:03	6:13
E.88th St. / Union	6.5	Dep.	4:18	5:08	6:18
Garfield Heights	12.1	Dep.	4:26	5:16	6:26
Bedford	15.0	Dep.	4:31	5:21	6:31
Northfield Pk./Walton Hills	19.0	Dep.	4:36	5:26	6:36
Macedonia	24.9	Dep.	4:42	5:32	6:42
Hudson	27.5	Dep.	4:50	5:40	6:50
Silver Lake	32.0	Dep.	4:58	5:48	6:58
Cuyahoga Falls	36.4	Dep.	5:03	5:53	7:03
Akron-Quaker Square	38.8	**Arr.**	**5:12**	**6:09**	**7:19**
		Dep.	**5:19**	**6:16**	**7:26**
South Akron	43.9	Dep.	5:29	6:26	7:36
Myersville / Uniontown	50.1	Dep.	5:36	6:33	7:43
Akron/Canton Airport	53.7	Dep.	5:44	6:41	7:51
Belden Village / N. Canton	56.6	Dep.	5:50	6:47	7:57
Football Hall of Fame	59.6	Dep.	5:56	6:53	8:03
Canton -- Tuscarawas St.	61.1	**Arr.**	**6:00**	**6:57**	**8:07**
			P.M.	P.M.	P.M.

Estimated Performance in year 2025
Level of Service Option 1:
Rush hour service to Cleveland only -- 3 daily round trips.

Daily ridership (trips): 1,100 to Cuyahoga Falls only.
Capital cost (2001 dollars): $188 million to Cuyahoga Falls.

NEO RAIL ROUTE 4 -- SOUTH CORRIDOR

LEVEL OF SERVICE 2 -- 6 Daily Round Trips

Service Option **2**

WEEKDAYS
NORTHBOUND / WESTBOUND

TRAIN NUMBERS Read Down ↓		401	403	405	407	409	411
		A.M.	A.M.	A.M.	A.M.	P.M.	P.M.
Canton -- Tuscarawas St.	**Dep.**	-	**5:49**	**6:54**	-	**2:04**	-
Football Hall of Fame	Dep.	-	5:53	6:58	-	2:08	-
Belden Village / N. Canton	Dep.	-	5:59	7:04	-	2:14	-
Akron/Canton Airport	Dep.	-	6:05	7:10	-	2:20	-
Myersville / Uniontown	Dep.	-	6:13	7:18	-	2:28	-
South Akron	Dep.	-	6:20	7:25	-	2:35	-
Akron-Quaker Square	**Arr.**	**-**	**6:29**	**7:34**	**-**	**2:39**	**-**
	Dep.	**6:05**	**6:33**	**7:38**	**8:45**	**2:48**	**5:15**
Cuyahoga Falls	Dep.	6:15	6:43	7:48	8:55	2:58	5:25
Silver Lake	Dep.	6:20	6:48	7:53	9:00	3:03	5:30
Hudson	Dep.	6:28	6:56	8:01	9:08	3:11	5:38
Macedonia	Dep.	6:36	7:04	8:09	9:16	3:19	5:46
Northfield Pk./Walton Hills	Dep.	6:42	7:10	8:15	9:22	3:25	5:52
Bedford	Dep.	6:47	7:15	8:20	9:27	3:30	5:57
Garfield Heights	Dep.	6:52	7:20	8:25	9:32	3:35	6:02
E.88th St. / Union	Dep.	7:00	7:28	8:33	9:40	3:43	6:10
E.55th St. / Euclid	Dep.	7:05	7:33	8:38	9:45	3:48	6:15
Cleveland - North Coast	**Arr.**	7:13	7:41	8:46	9:53	3:56	6:23
		A.M.	A.M.	A.M.	A.M.	P.M.	P.M.

SOUTHBOUND / EASTBOUND

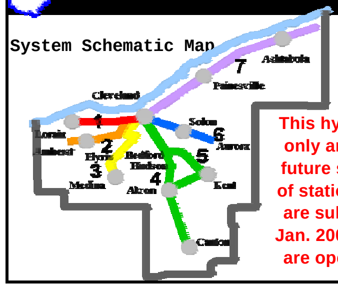
TRAIN NUMBERS Read Down ↓		400	402	404	406	408	410
		A.M.	A.M.	P.M.	P.M.	P.M.	P.M.
Cleveland - North Coast	**Dep.**	7:20	**11:50**	**4:05**	**4:55**	**6:05**	**7:00**
E.55th St. / Euclid	Dep.	7:28	11:58	4:13	5:03	6:13	7:08
E.88th St. / Union	Dep.	7:33	12:03	4:18	5:08	6:18	7:13
Garfield Heights	Dep.	7:41	12:11	4:26	5:16	6:26	7:21
Bedford	Dep.	7:46	12:16	4:31	5:21	6:31	7:26
Northfield Pk./Walton Hills	Dep.	7:51	12:21	4:36	5:26	6:36	7:31
Macedonia	Dep.	7:57	12:27	4:42	5:32	6:42	7:37
Hudson	Dep.	8:05	12:35	4:50	5:40	6:50	7:45
Silver Lake	Dep.	8:13	12:43	4:58	5:48	6:58	7:53
Cuyahoga Falls	Dep.	8:18	12:48	5:03	5:53	7:03	7:58
Akron-Quaker Square	**Arr.**	8:27	**1:04**	**5:12**	**6:09**	**7:19**	**8:07**
	Dep.	-	**1:11**	**5:19**	**6:16**	**7:26**	-
South Akron	Dep.	-	1:21	5:29	6:26	7:36	-
Myersville / Uniontown	Dep.	-	1:28	5:36	6:33	7:43	-
Akron/Canton Airport	Dep.	-	1:36	5:44	6:41	7:51	-
Belden Village / N. Canton	Dep.	-	1:42	5:50	6:47	7:57	-
Football Hall of Fame	Dep.	-	1:48	5:56	6:53	8:03	-
Canton -- Tuscarawas St.	**Arr.**	-	**1:52**	**6:00**	**6:57**	**8:07**	-
		A.M.	A.M.	A.M.	A.M.	A.M.	P.M.

Estimated Performance in year 2025
Level of Service Option 2:
Rush hour and limited off-peak service -- 6 daily round trips.

Daily ridership (trips): 3,400
Capital cost (2001 dollars): $430 million

NEO RAIL
NORTHEAST OHIO
COMMUTER RAIL

System Schematic Map



Disclaimer:
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Facts & Figures
Route 4 ● South Corridor

Total length of route is 61 miles.
Serves cities of Cleveland, Akron and Canton.
Overlapping service area with Route 5.
Inner 6 miles closest to Cleveland requires construction of a new passenger track parallel to the NS main line.

Extensive construction of new passenger track between Bedford and Hudson.
New track connections required at E.88th, Garfield Hts., Hudson and Akron.
Transfer at E.55th/Euclid to Euclid Ave buses & University Circle
Transfer at E.88th/Union for NEORail Solon-Aurora line
Service subject to negotiated agreement w/ freight railroad right-of-way owners (e.g.,NS).

Sample Fares

	To Cleveland		To Akron	
	One-way	Monthly	One-way	Monthly
Cleveland			#REF!	#REF!
E.55th St. / Euclid	#REF!	#REF!	#REF!	#REF!
E.88th St. / Union	#REF!	#REF!	#REF!	#REF!
Garfield Heights	#REF!	#REF!	#REF!	#REF!
Bedford	#REF!	#REF!	#REF!	#REF!
Northfield Park/Walton Hills	#REF!	#REF!	#REF!	#REF!
Macedonia	#REF!	#REF!	#REF!	#REF!
Hudson	#REF!	#REF!	#REF!	#REF!
Silver Lake	#REF!	#REF!	#REF!	#REF!
Cuyahoga Falls	#REF!	#REF!	#REF!	#REF!
Akron	#REF!	#REF!		
South Akron	#REF!	#REF!	#REF!	#REF!
Myersville/Uniontown	#REF!	#REF!	#REF!	#REF!
Akron/Canton Airport	#REF!	#REF!	#REF!	#REF!
N. Canton-Belden Village	#REF!	#REF!	#REF!	#REF!
Football Hall of Fame	#REF!	#REF!	#REF!	#REF!
Canton	#REF!	#REF!	#REF!	#REF!

Would you ride any of these trains?
If so (or if not), please fill out a questionnaire form telling us which trains you'd ride, and whether you would use the service for trips to work, school, sporting or other special events or other purposes.
Or, contact us at the study's web site: **www.pb4d.com/neorail**

NEORail Study Phase II
Northeast Ohio Commuter Rail Feasibility Study

Example Only

NEO RAIL
NORTHEAST OHIO
COMMUTER RAIL

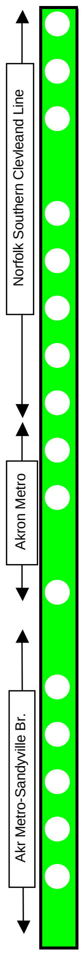
ROUTE
4
SOUTH
CORRRIDOR

Cleveland
Hudson
Akron
Canton

Serving Cuyahoga, Summit and Stark Counties

Historic Route of the Pennsylvania Railroad

HYPOTHETICAL TIMETABLE



Cleveland
E.55th / Euclid
E.88th / Union

Garfield Heights
Bedford
Northfield Pk./Walton Hills
Macedonia
Hudson
Silver Lake
Cuyahoga Falls

Akron

South Akron
Myersville / Uniontown
Akron-Canton Airport
N. Canton / Belden Vill.
Canton

NEO RAIL ROUTE 4 -- SOUTH CORRIDOR

LEVEL OF SERVICE 3 -- 12 Daily Round Trips

Service
Option
3

WEEKDAYS
NORTHBOUND / WESTBOUND

34.0

Read Down ↓	Location	Mileage	TRAIN NUMBERS	401	403	405	407	409	411	413	415	401	417	419	421
				A.M.	A.M.	A.M.	A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M.	P.M.	P.M.
Canton	Tuscarawas St.	0.0	**Dep.**	**-**	**5:49**	**6:24**	**7:04**	**7:49**	**9:34**	**11:24**	**2:19**	**-**	**4:19**	**5:09**	**6:04**
Football Hall of Fame	Fulton Drive	1.5	Dep.	-	5:53	6:28	7:08	7:53	9:38	11:28	2:23	-	4:23	5:13	6:08
N. Canton-Belden Village	Everhard Rd.	4.5	Dep.	-	5:59	6:34	7:14	7:59	9:44	11:34	2:29	-	4:29	5:19	6:14
Akron-Canton Airport	Mt. Pleasant St.	7.4	Dep.	-	6:05	6:40	7:20	8:05	9:50	11:40	2:35	-	4:35	5:25	6:20
Myersville / Uniontown	SR 619-Edison St.	11.0	Dep.	-	6:13	6:48	7:28	8:13	9:58	11:48	2:43	-	4:43	5:33	6:28
South Akron	SR 764-Triplett Blvd	17.2	Dep.	-	6:20	6:55	7:35	8:20	10:05	11:55	2:50	-	4:50	5:40	6:35
Akron	Quaker Square	22.3	**Arr.**	-	**6:29**	**7:04**	**7:44**	**8:29**	**10:14**	**12:04**	**2:59**	**-**	**4:59**	**5:49**	**6:44**
	Broadway & University		**Dep.**	**6:00**	**6:36**	**7:11**	**7:51**	**8:36**	**10:21**	**12:11**	**3:06**	**4:10**	**5:06**	**5:56**	**6:51**
Cuyahoga Falls	Broad Blvd.	24.7	Dep.	6:10	6:46	7:21	8:01	8:46	10:31	12:21	3:16	4:20	5:16	6:06	7:01
Silver Lake	Graham Road	29.1	Dep.	6:15	6:51	7:26	8:06	8:51	10:36	12:26	3:21	4:25	5:21	6:11	7:06
Hudson	Milford Rd.-Hudson P	33.6	Dep.	6:23	6:59	7:34	8:14	8:59	10:44	12:34	3:29	4:33	5:29	6:19	7:14
Macedonia	SR 82 & I-271	36.2	Dep.	6:31	7:07	7:42	8:22	9:07	10:52	12:42	3:37	4:41	5:37	6:27	7:22
Northfield Pk./Walton Hil	SR 8-Alexander Rd.	42.1	Dep.	6:37	7:13	7:48	8:28	9:13	10:58	12:48	3:43	4:47	5:43	6:33	7:28
Bedford	Grace St.	46.1	Dep.	6:42	7:18	7:53	8:33	9:18	11:03	12:53	3:48	4:52	5:48	6:38	7:33
Garfield Heights	I-480	49.0	Dep.	6:47	7:23	7:58	8:38	9:23	11:08	12:58	3:53	4:57	5:53	6:43	7:38
E.88th St. / Union	Union Ave.	54.6	Dep.	6:55	7:31	8:06	8:46	9:31	11:16	1:06	4:01	5:05	6:01	6:51	7:46
E.55th St. / Euclid	Euclid Ave. & E.55th	56.7	Dep.	7:00	7:36	8:11	8:51	9:36	11:21	1:11	4:06	5:10	6:06	6:56	7:51
Cleveland - North Coast	North Coast Transp.	61.1	**Arr.**	**7:08**	**7:44**	**8:19**	**8:59**	**9:44**	**11:29**	**1:19**	**4:14**	**5:18**	**6:14**	**7:04**	**7:59**
	W.3rd to E.9th Sts.			A.M.	A.M.	A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.

SOUTHBOUND / EASTBOUND

Read Down ↓	Mileage	TRAIN NUMBERS	400	402	404	406	408	410	412	414	416	418	420	422	424	426
			A.M.	A.M.	A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M.	A.M.	P.M.	P.M.	P.M.	P.M.
Cleveland - North Coast	0.0	**Dep.**	-	**6:05**	**6:45**	**7:30**	**10:00**	**11:50**	**2:00**	**3:50**	**4:20**	**4:50**	**5:30**	**6:40**	**8:30**	**11:00**
E.55th St. / Euclid	4.4	Dep.	-	6:13	6:53	7:38	10:08	11:58	2:08	3:58	4:28	4:58	5:38	6:48	8:38	11:08
E.88th St. / Union	6.5	Dep.	-	6:18	6:58	7:43	10:13	12:03	2:13	4:03	4:33	5:03	5:43	6:53	8:43	11:13
Garfield Heights	12.1	Dep.	-	6:26	7:06	7:51	10:21	12:11	2:21	4:11	4:41	5:11	5:51	7:01	8:51	11:21
Bedford	15.0	Dep.	-	6:31	7:11	7:56	10:26	12:16	2:26	4:16	4:46	5:16	5:56	7:06	8:56	11:26
Northfield Pk./Walton Hills	19.0	Dep.	-	6:36	7:16	8:01	10:31	12:21	2:31	4:21	4:51	5:21	6:01	7:11	9:01	11:31
Macedonia	24.9	Dep.	-	6:42	7:22	8:07	10:37	12:27	2:37	4:27	4:57	5:27	6:07	7:17	9:07	11:37
Hudson	27.5	Dep.	-	6:50	7:30	8:15	10:45	12:35	2:45	4:35	5:05	5:35	6:15	7:25	9:15	11:45
Silver Lake	32.0	Dep.	-	6:58	7:38	8:23	10:53	12:43	2:53	4:43	5:13	5:43	6:23	7:33	9:23	11:53
Cuyahoga Falls	36.4	Dep.	-	7:03	7:43	8:28	10:58	12:48	2:58	4:48	5:18	5:48	6:28	7:38	9:28	11:58
Akron	38.8	**Arr.**	-	**7:12**	**7:52**	**8:37**	**11:07**	**12:57**	**3:07**	**4:57**	**5:27**	**5:57**	**6:37**	**7:47**	**9:37**	**12:07**
		Dep.	**6:50**	**7:19**	**7:59**	-	**11:14**	**1:04**	**3:14**	**5:04**	**5:34**	**6:04**	-	**7:54**	-	**12:14**
South Akron	43.9	Dep.	7:00	7:29	8:09	-	11:24	1:14	3:24	5:14	5:44	6:14	-	8:04	-	12:24
Myersville / Uniontown	50.1	Dep.	7:07	7:36	8:16	-	11:31	1:21	3:31	5:21	5:51	6:21	-	8:11	-	12:31
Akron-Canton Airport	53.7	Dep.	7:15	7:44	8:24	-	11:39	1:29	3:39	5:29	5:59	6:29	-	8:19	-	12:39
N. Canton-Belden Village	56.6	Dep.	7:21	7:50	8:30	-	11:45	1:35	3:45	5:35	6:05	6:35	-	8:25	-	12:45
Football Hall of Fame	59.6	Dep.	7:27	7:56	8:36	-	11:51	1:41	3:51	5:41	6:11	6:41	-	8:31	-	12:51
Canton	61.1	**Arr.**	**7:31**	**8:00**	**8:40**	**-**	**11:55**	**1:45**	**3:55**	**5:45**	**6:15**	**6:45**	**-**	**8:35**	**-**	**12:55**
			A.M.	A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	A.M.

Estimated Performance in year 2025
Level of Service Option 3:
Full service -- rush hour to Cleveland, reverse peak and bi-hourly off-peak -- 24 daily round trips.
Requires 7 trainsets to operate this service.

Daily ridership (trips): 5,600
Capital cost (2001 dollars): $453 million

NEO RAIL ROUTE 4 -- SOUTH CORRIDOR

LEVEL OF SERVICE 3 -- 8 Daily Round Trips on Weekends

Service
Option
3

SATURDAYS, SUNDAYS AND HOLIDAYS
NORTHBOUND / WESTBOUND

Read Down ↓	TRAIN NUMBERS	451	453	455	457	459	461	463	415
		A.M.	A.M.	A.M.	P.M.	P.M.	P.M.	P.M.	P.M.
Canton	**Dep.**	**7:04**	**9:04**	**11:04**	**1:04**	**3:04**	**5:04**	**7:04**	**9:04**
Football Hall of Fame	Dep.	7:08	9:08	11:08	1:08	3:08	5:08	7:08	9:08
N. Canton-Belden Village	Dep.	7:14	9:14	11:14	1:14	3:14	5:14	7:14	9:14
Akron-Canton Airport	Dep.	7:20	9:20	11:20	1:20	3:20	5:20	7:20	9:20
Myersville / Uniontown	Dep.	7:28	9:28	11:28	1:28	3:28	5:28	7:28	9:28
South Akron	Dep.	7:35	9:35	11:35	1:35	3:35	5:35	7:35	9:35
Akron	**Arr.**	**7:44**	**9:44**	**11:44**	**1:44**	**3:44**	**5:44**	**7:44**	**9:44**
	Dep.	**7:51**	**9:51**	**11:51**	**1:51**	**3:51**	**5:51**	**7:51**	**9:51**
Cuyahoga Falls	Dep.	8:01	10:01	12:01	2:01	4:01	6:01	8:01	10:01
Silver Lake	Dep.	8:06	10:06	12:06	2:06	4:06	6:06	8:06	10:06
Hudson	Dep.	8:14	10:14	12:14	2:14	4:14	6:14	8:14	10:14
Macedonia	Dep.	8:22	10:22	12:22	2:22	4:22	6:22	8:22	10:22
Northfield Pk./Walton Hi	Dep.	8:28	10:28	12:28	2:28	4:28	6:28	8:28	10:28
Bedford	Dep.	8:33	10:33	12:33	2:33	4:33	6:33	8:33	10:33
Garfield Heights	Dep.	8:38	10:38	12:38	2:38	4:38	6:38	8:38	10:38
E.88th St. / Union	Dep.	8:46	10:46	12:46	2:46	4:46	6:46	8:46	10:46
E.55th St. / Euclid	Dep.	8:51	10:51	12:51	2:51	4:51	6:51	8:51	10:51
Cleveland - North Coast	**Arr.**	**8:59**	**10:59**	**12:59**	**2:59**	**4:59**	**6:59**	**8:59**	**10:59**
		A.M.	A.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.

SOUTHBOUND / EASTBOUND

Read Down ↓	TRAIN NUMBERS	450	452	454	456	458	460	462	464
		A.M.	A.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.
Cleveland - North Coast	**Dep.**	**9:30**	**11:30**	**1:30**	**3:30**	**5:30**	**7:30**	**9:30**	**11:30**
E.55th St. / Euclid	Dep.	9:38	11:38	1:38	3:38	5:38	7:38	9:38	11:38
E.88th St. / Union	Dep.	9:43	11:43	1:43	3:43	5:43	7:43	9:43	11:43
Garfield Heights	Dep.	9:51	11:51	1:51	3:51	5:51	7:51	9:51	11:51
Bedford	Dep.	9:56	11:56	1:56	3:56	5:56	7:56	9:56	11:56
Northfield Pk./Walton Hi	Dep.	10:01	12:01	2:01	4:01	6:01	8:01	10:01	12:01
Macedonia	Dep.	10:07	12:07	2:07	4:07	6:07	8:07	10:07	12:07
Hudson	Dep.	10:15	12:15	2:15	4:15	6:15	8:15	10:15	12:15
Silver Lake	Dep.	10:23	12:23	2:23	4:23	6:23	8:23	10:23	12:23
Cuyahoga Falls	Dep.	10:28	12:28	2:28	4:28	6:28	8:28	10:28	12:28
Akron	**Arr.**	**10:37**	**12:37**	**2:37**	**4:37**	**6:37**	**8:37**	**10:37**	**12:37**
	Dep.	**10:44**	**12:44**	**2:44**	4:44	**6:44**	**8:44**	**10:44**	12:44
South Akron	Dep.	10:54	12:54	2:54	4:54	6:54	8:54	10:54	12:54
Myersville / Uniontown	Dep.	11:01	13:01	3:01	5:01	7:01	9:01	11:01	13:01
Akron-Canton Airport	Dep.	11:09	13:09	3:09	5:09	7:09	9:09	11:09	1:09
N. Canton-Belden Village	Dep.	11:15	13:15	3:15	5:15	7:15	9:15	11:15	1:15
Football Hall of Fame	Dep.	11:21	13:21	3:21	5:21	7:21	9:21	11:21	1:21
Canton	**Arr.**	**11:25**	**13:25**	**3:25**	**5:25**	**7:25**	**9:25**	**11:25**	**1:25**
		A.M.	A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	A.M.

Example Only

NEO RAIL ROUTE 5 -- SOUTH CORRIDOR

LEVEL OF SERVICE 1 -- 3 Peak Trips

Service Option 1

WEEKDAYS
NORTHBOUND / WESTBOUND

Read Down ↓	Mileage		501	503	505
			A.M.	A.M.	A.M.
Canton -- Tuscarawas St.	0.0	**Dep.**	-	**5:55**	**6:43**
Football Hall of Fame	1.5	Dep.	-	5:59	6:47
Belden Village / N. Canton	4.5	Dep.	-	6:05	6:53
Akron/Canton Airport	7.4	Dep.	-	6:11	6:59
Myersville / Uniontown	11.0	Dep.	-	6:19	7:07
South Akron	17.2	Dep.	-	6:26	7:14
Akron	22.3	**Arr.**	-	**6:35**	**7:23**
		Dep.	**5:55**	**6:42**	**7:30**
Tallmadge	26.3	Dep.	6:04	6:51	7:39
Kent	32.7	Dep.	6:15	7:02	7:50
Streetsboro	41.5	Dep.	6:37	7:24	8:12
Twinsburg	45.6	Dep.	6:45	7:32	8:20
Glenwillow	48.8	Dep.	6:51	7:38	8:26
Bedford	55.0	Dep.	7:04	7:51	8:39
Garfield Heights	57.9	Dep.	7:09	7:56	8:44
E.88th St. / Union	63.5	Dep.	7:17	8:04	8:52
E.55th St. / Euclid	65.6	Dep.	7:22	8:09	8:57
Cleveland - North Coast	70.0	**Arr.**	**7:30**	**8:17**	**9:05**
			A.M.	A.M.	A.M.

SOUTHBOUND / EASTBOUND

Read Down ↓	Mileage		500	502	504
			P.M.	P.M.	P.M.
Cleveland - North Coast	0.0	**Dep.**	**4:05**	**4:55**	**6:05**
E.55th St. / Euclid	4.4	Dep.	4:13	5:03	6:13
E.88th St. / Union	6.5	Dep.	4:18	5:08	6:18
Garfield Heights	12.1	Dep.	4:26	5:16	6:26
Bedford	15.0	Dep.	4:31	5:21	6:31
Glenwillow	21.2	Dep.	4:44	5:34	6:44
Twinsburg	24.4	Dep.	4:50	5:40	6:50
Streetsboro	28.5	Dep.	4:58	5:48	6:58
Kent	37.3	Arr.	5:07	5:57	7:07
Tallmadge	43.7	Arr.	5:31	6:21	7:31
Akron	47.7	**Arr.**	**5:39**	**6:29**	**7:39**
		Dep.	**5:46**	**6:36**	**7:46**
South Akron	52.8	Dep.	5:56	6:46	7:56
Myersville / Uniontown	59.0	Dep.	6:03	6:53	8:03
Akron/Canton Airport	62.6	Dep.	6:11	7:01	8:11
Belden Village / N. Canton	65.5	Dep.	6:17	7:07	8:17
Football Hall of Fame	68.5	Dep.	6:23	7:13	8:23
Canton -- Tuscarawas St.	70.0	**Arr.**	**6:27**	**7:17**	**8:27**
			P.M.	P.M.	P.M.

Estimated Performance in year 2025
Level of Service Option 1:
Rush hour service to Cleveland only -- 3 daily round trips.

Daily ridership (trips): 850 to Kent only.
Capital cost (2001 dollars): $172 million to Kent

NEO RAIL ROUTE 5 -- SOUTH CORRIDOR

LEVEL OF SERVICE 2 -- 6 Daily Round Trips

Service Option 2

WEEKDAYS
NORTHBOUND / WESTBOUND

Read Down ↓		501	503	505	507	509	511
		A.M.	A.M.	A.M.	A.M.	P.M.	P.M.
Canton -- Tuscarawas St.	**Dep.**	-	**5:55**	**6:43**	-	**2:00**	-
Football Hall of Fame	Dep.	-	5:59	6:47	-	2:04	-
Belden Village / N. Canton	Dep.	-	6:05	6:53	-	2:10	-
Akron/Canton Airport	Dep.	-	6:11	6:59	-	2:16	-
Myersville / Uniontown	Dep.	-	6:19	7:07	-	2:24	-
South Akron	Dep.	-	6:26	7:14	-	2:31	-
Akron	**Arr.**	-	**6:35**	**7:23**	-	**2:40**	-
	Dep.	**5:55**	**6:42**	**7:30**	**9:30**	**2:47**	**5:45**
Tallmadge	Dep.	6:04	6:51	7:39	9:39	2:56	5:54
Kent	Dep.	6:15	7:02	7:50	9:50	3:07	6:05
Streetsboro	Dep.	6:37	7:24	8:12	10:12	3:29	6:27
Twinsburg	Dep.	6:45	7:32	8:20	10:20	3:37	6:35
Glenwillow	Dep.	6:51	7:38	8:26	10:26	3:43	6:41
Bedford	Dep.	7:04	7:51	8:39	10:39	3:56	6:54
Garfield Heights	Dep.	7:09	7:56	8:44	10:44	4:01	6:59
E.88th St. / Union	Dep.	7:17	8:04	8:52	10:52	4:09	7:07
E.55th St. / Euclid	Dep.	7:22	8:09	8:57	10:57	4:14	7:12
Cleveland - North Coast	**Arr.**	7:30	8:17	9:05	11:05	4:22	7:20
		A.M.	A.M.	A.M.	A.M.	P.M.	P.M.

SOUTHBOUND / EASTBOUND

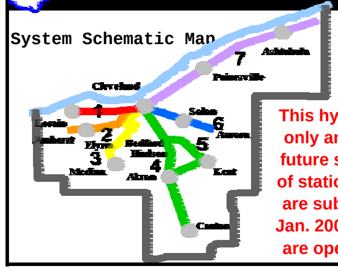
Read Down ↓		500	502	504	506	508	510
		A.M.	A.M.	P.M.	P.M.	P.M.	P.M.
Cleveland - North Coast	**Dep.**	**7:40**	**11:20**	**4:05**	**4:50**	**5:45**	**7:30**
E.55th St. / Euclid	Dep.	7:48	11:28	4:13	4:58	5:53	7:38
E.88th St. / Union	Dep.	7:53	11:33	4:18	5:03	5:58	7:43
Garfield Heights	Dep.	8:01	11:41	4:26	5:11	6:06	7:51
Bedford	Dep.	8:06	11:46	4:31	5:16	6:11	7:56
Glenwillow	Dep.	8:19	11:59	4:44	5:29	6:24	8:09
Twinsburg	Dep.	8:25	12:05	4:50	5:35	6:30	8:15
Streetsboro	Dep.	8:33	12:13	4:58	5:43	6:38	8:23
Kent	Arr.	8:42	12:22	5:07	5:52	6:47	8:32
Tallmadge	Arr.	9:06	12:46	5:31	6:16	7:11	8:56
Akron	**Arr.**	**9:14**	**12:54**	**5:39**	**6:24**	**7:19**	**9:04**
	Dep.	-	**1:01**	**5:46**	**6:31**	**7:26**	-
South Akron	Dep.	-	1:11	5:56	6:41	7:36	-
Myersville / Uniontown	Dep.	-	1:18	6:03	6:48	7:43	-
Akron/Canton Airport	Dep.	-	1:26	6:11	6:56	7:51	-
Belden Village / N. Canton	Dep.	-	1:32	6:17	7:02	7:57	-
Football Hall of Fame	Dep.	-	1:38	6:23	7:08	8:03	-
Canton -- Tuscarawas St.	**Arr.**	-	**1:42**	**6:27**	**7:12**	**8:07**	-
		A.M.	P.M.	P.M.	P.M.	P.M.	P.M.

Estimated Performance in year 2025
Level of Service Option 2:
Rush hour and limited off-peak service -- 6 daily round trips.

Daily ridership (trips): 3,100
Capital cost (2001 dollars): $418 million

NEO RAIL NORTHEAST OHI COMMUTER RAI

System Schematic Map



Disclaimer:
This hypothetical timetable is only an example of potential future service. The locations of stations and times of trains are subject to change. As of Jan. 2001, no commuter trains are operating on these lines.

Facts & Figures
Route 5 ● South Corridor

Total length of route is 70 miles, nine miles longer than Route 4.
Serves cities of Cleveland, Akron and Canton.
Overlapping service area with Routes 4 and 6.
Inner 6 miles closest to Cleveland requires construction of a new passenger track parallel to the NS main line.
New track connections required at E.88th, Garfield Hts., Kent and Akron.
Transfer at E.55th/Euclid to Euclid Ave buses & University Circle
Transfer at E.88th/Union for NEORail Solon-Aurora line
Service subject to negotiated agreement w/ freight railroad right-of-way owners (NS, WLE).

Sample Fares

	To Cleveland		To Akron	
	One-way	Monthly	One-way	Monthly
Cleveland			$5.25	$131.00
E.55th St. / Euclid	$2.00	$50.00	$4.75	$119.00
E.88th St. / Union	$2.25	$56.00	$4.50	$113.00
Garfield Heights	$2.75	$69.00	$4.00	$100.00
Bedford	$3.00	$75.00	$3.75	$94.00
Glenwillow	$3.50	$88.00	$3.50	$88.00
Twinsburg	$4.00	$100.00	$3.00	$75.00
Streetsboro	$4.25	$106.00	$2.75	$69.00
Kent	$4.50	$113.00	$2.25	$56.00
Tallmadge	$5.00	$125.00	$2.00	$50.00
Akron	$5.25	$131.00		
South Akron	$5.75	$144.00	$2.25	$56.00
Myersville/Uniontown	$6.25	$156.00	$2.75	$69.00
Akron/Canton Airport	$6.50	$163.00	$3.00	$75.00
N. Canton-Belden Village	$6.75	$169.00	$3.25	$81.00
Football Hall of Fame	$7.00	$175.00	$3.50	$88.00
Canton	$7.25	$181.00	$3.75	$94.00

Would you ride any of these trains?
If so (or if not), please fill out a questionnaire form telling us which trains you'd ride, and whether you would use the service for trips to work, school, sporting or other special events or other purposes.
Or, contact us at the study's web site: **www.pb4d.com/neorail**

NEORail Study Phase II
Northeast Ohio Commuter Rail Feasibility Study

NEO RAIL NORTHEAST OHIO COMMUTER RAIL

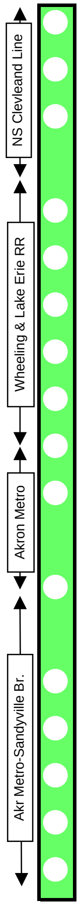
ROUTE
5
SOUTH
CORRRIDOR

Cleveland
Kent
Akron
Canton

Serving Cuyahoga, Summit, Portage and Stark Counties

Route of the Wheeling & Lake Erie Railroad

HYPOTHETICAL TIMETABLE



Cleveland
E.55th / Euclid
E.88th / Union

Garfield Heights
Bedford
Glenwillow
Twinsburg
Streetsboro
Kent
Tallmadge

Akron

South Akron
Myersville / Uniontown
Akron-Canton Airport
N. Canton / Belden Vill.
Canton

Example Only

NEO RAIL ROUTE 5 -- SOUTH CORRIDOR

LEVEL OF SERVICE 3 -- 12 Daily Round Trips

Service Option 3

WEEKDAYS
NORTHBOUND / WESTBOUND

34.0

Read Down ↓	Location	Mileage	TRAIN NUMBERS	501	503	505	507	509	511	513	515	401	517	519	521
				A.M.	A.M.	A.M.	A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M.	P.M.	P.M.
Canton	Tuscarawas St.	0.0	Dep.	-	5:24	5:59	6:39	7:24	9:09	10:59	1:54	-	3:54	4:44	5:39
Football Hall of Fame	Fulton Drive	1.5	Dep.	-	5:28	6:03	6:43	7:28	9:13	11:03	1:58	-	3:58	4:48	5:43
N. Canton-Belden Village	Everhard Rd.	4.5	Dep.	-	5:34	6:09	6:49	7:34	9:19	11:09	2:04	-	4:04	4:54	5:49
Akron-Canton Airport	Mt. Pleasant St.	7.4	Dep.	-	5:40	6:15	6:55	7:40	9:25	11:15	2:10	-	4:10	5:00	5:55
Myersville / Uniontown	SR 619-Edison St.	11.0	Dep.	-	5:48	6:23	7:03	7:48	9:33	11:23	2:18	-	4:18	5:08	6:03
South Akron	SR 764-Triplett Blvd	17.2	Dep.	-	5:55	6:30	7:10	7:55	9:40	11:30	2:25	-	4:25	5:15	6:10
Akron	Quaker Square	22.3	Arr.	-	6:04	6:39	7:19	8:04	9:49	11:39	2:34	-	4:34	5:24	6:19
	Broadway & University		Dep.	5:35	6:11	6:46	7:26	8:11	9:56	11:46	2:41	4:10	4:41	5:31	6:26
Tallmadge	Erie St. & Southeast	26.3	Dep.	5:44	6:20	6:55	7:35	8:20	10:05	11:55	2:50	4:19	4:50	5:40	6:35
Kent	SR 261	32.7	Dep.	5:55	6:31	7:06	7:46	8:31	10:16	12:06	3:01	4:30	5:01	5:51	6:46
Streetsboro	Mondial Pkwy. at SR	41.5	Dep.	6:17	6:53	7:28	8:08	8:53	10:38	12:28	3:23	4:52	5:23	6:13	7:08
Twinsburg	SR 82-East Aurora Rd	45.6	Dep.	6:25	7:01	7:36	8:16	9:01	10:46	12:36	3:31	5:00	5:31	6:21	7:16
Glenwillow	Pettibone Road	48.8	Dep.	6:31	7:07	7:42	8:22	9:07	10:52	12:42	3:37	5:06	5:37	6:27	7:22
Bedford	Grace St.	55.0	Dep.	6:44	7:20	7:55	8:35	9:20	11:05	12:55	3:50	5:19	5:50	6:40	7:35
Garfield Heights	I-480	57.9	Dep.	6:49	7:25	8:00	8:40	9:25	11:10	13:00	3:55	5:24	5:55	6:45	7:40
E.88th St. / Union	Union Ave.	63.5	Dep.	6:57	7:33	8:08	8:48	9:33	11:18	1:08	4:03	5:32	6:03	6:53	7:48
E.55th St. / Euclid	Euclid Ave. & E.55th	65.6	Dep.	7:02	7:38	8:13	8:53	9:38	11:23	1:13	4:08	5:37	6:08	6:58	7:53
Cleveland - North Coast	North Coast Transp.	70.0	Arr.	7:10	7:46	8:21	9:01	9:46	11:31	1:21	4:16	5:45	6:16	7:06	8:01
	W.3rd to E.9th Sts.			A.M.	A.M.	A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.

SOUTHBOUND / EASTBOUND

Read Down ↓	Mileage	TRAIN NUMBERS	500	502	504	506	508	510	512	514	516	518	520	522	524	526
			A.M.	A.M.	A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M.	A.M.	P.M.	P.M.	P.M.	P.M.
Cleveland - North Coast	0.0	Dep.	-	6:05	6:45	7:30	10:00	11:50	2:00	3:50	4:20	4:50	5:30	6:40	8:30	11:00
E.55th St. / Euclid	4.4	Dep.	-	6:13	6:53	7:38	10:08	11:58	2:08	3:58	4:28	4:58	5:38	6:48	8:38	11:08
E.88th St. / Union	6.5	Dep.	-	6:18	6:58	7:43	10:13	12:03	2:13	4:03	4:33	5:03	5:43	6:53	8:43	11:13
Garfield Heights	12.1	Dep.	-	6:26	7:06	7:51	10:21	12:11	2:21	4:11	4:41	5:11	5:51	7:01	8:51	11:21
Bedford	15.0	Dep.	-	6:31	7:11	7:56	10:26	12:16	2:26	4:16	4:46	5:16	5:56	7:06	8:56	11:26
Glenwillow	21.2	Dep.	-	6:44	7:24	8:09	10:39	12:29	2:39	4:29	4:59	5:29	6:09	7:19	9:09	11:39
Twinsburg	24.4	Dep.	-	6:50	7:30	8:15	10:45	12:35	2:45	4:35	5:05	5:35	6:15	7:25	9:15	11:45
Streetsboro	28.5	Dep.	-	6:58	7:38	8:23	10:53	12:43	2:53	4:43	5:13	5:43	6:23	7:33	9:23	11:53
Kent	37.3	Arr.	-	7:07	7:47	8:32	11:02	12:52	3:02	4:52	5:22	5:52	6:32	7:42	9:32	12:02
Tallmadge	43.7	Arr.	-	7:31	8:11	8:56	11:26	13:16	3:26	5:16	5:46	6:16	6:56	8:06	9:56	12:26
Akron	47.7	Arr.	-	7:39	8:19	9:04	11:34	13:24	3:34	5:24	5:54	6:24	7:04	8:14	10:04	12:34
		Dep.	6:50	7:46	8:26	-	11:41	1:31	3:41	5:31	6:01	6:31	-	8:21	-	12:41
South Akron	52.8	Dep.	7:00	7:56	8:36	-	11:51	1:41	3:51	5:41	6:11	6:41	-	8:31	-	12:51
Myersville / Uniontown	59.0	Dep.	7:07	8:03	8:43	-	11:58	1:48	3:58	5:48	6:18	6:48	-	8:38	-	12:58
Akron-Canton Airport	62.6	Dep.	7:15	8:11	8:51	-	12:06	1:56	4:06	5:56	6:26	6:56	-	8:46	-	1:06
N. Canton-Belden Village	65.5	Dep.	7:21	8:17	8:57	-	12:12	2:02	4:12	6:02	6:32	7:02	-	8:52	-	1:12
Football Hall of Fame	68.5	Dep.	7:27	8:23	9:03	-	12:18	2:08	4:18	6:08	6:38	7:08	-	8:58	-	1:18
Canton	70.0	Arr.	7:31	8:27	9:07	-	12:22	2:12	4:22	6:12	6:42	7:12	-	9:02	-	1:22
			A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	A.M.

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Estimated Performance in year 2025

Level of Service Option 3:
Full service -- rush hour to Cleveland, reverse peak and bi-hourly off-peak -- 24 daily round trips.
Requires 8 trainsets to operate this service.

Daily ridership (trips): 5,100
Capital cost (2001 dollars): $440 million

NEO RAIL ROUTE 5 -- SOUTH CORRIDOR

LEVEL OF SERVICE 3 -- 8 Daily Round Trips on Weekends

Service Option 3

SATURDAYS, SUNDAYS AND HOLIDAYS
NORTHBOUND / WESTBOUND

Read Down ↓	TRAIN NUMBERS	551	553	555	557	559	561	563	415
		A.M.	A.M.	A.M.	P.M.	P.M.	P.M.	P.M.	P.M.
Canton	Dep.	6:37	8:37	10:37	12:37	2:37	4:37	6:37	8:37
Football Hall of Fame	Dep.	6:41	8:41	10:41	12:41	2:41	4:41	6:41	8:41
N. Canton-Belden Village	Dep.	6:47	8:47	10:47	12:47	2:47	4:47	6:47	8:47
Akron-Canton Airport	Dep.	6:53	8:53	10:53	12:53	2:53	4:53	6:53	8:53
Myersville / Uniontown	Dep.	7:01	9:01	11:01	1:01	3:01	5:01	7:01	9:01
South Akron	Dep.	7:08	9:08	11:08	1:08	3:08	5:08	7:08	9:08
Akron	Arr.	7:17	9:17	11:17	1:17	3:17	5:17	7:17	9:17
	Dep.	7:24	9:24	11:24	1:24	3:24	5:24	7:24	9:24
Tallmadge	Dep.	7:33	9:33	11:33	1:33	3:33	5:33	7:33	9:33
Kent	Dep.	7:44	9:44	11:44	1:44	3:44	5:44	7:44	9:44
Streetsboro	Dep.	8:06	10:06	12:06	2:06	4:06	6:06	8:06	10:06
Twinsburg	Dep.	8:14	10:14	12:14	2:14	4:14	6:14	8:14	10:14
Glenwillow	Dep.	8:20	10:20	12:20	2:20	4:20	6:20	8:20	10:20
Bedford	Dep.	8:33	10:33	12:33	2:33	4:33	6:33	8:33	10:33
Garfield Heights	Dep.	8:38	10:38	12:38	2:38	4:38	6:38	8:38	10:38
E.88th St. / Union	Dep.	8:46	10:46	12:46	2:46	4:46	6:46	8:46	10:46
E.55th St. / Euclid	Dep.	8:51	10:51	12:51	2:51	4:51	6:51	8:51	10:51
Cleveland - North Coast	Arr.	8:59	10:59	12:59	2:59	4:59	6:59	8:59	10:59
		A.M.	A.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.

SOUTHBOUND / EASTBOUND

Read Down ↓	TRAIN NUMBERS	550	552	554	556	558	560	562	564
		A.M.	A.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.
Cleveland - North Coast	Dep.	9:30	11:30	1:30	3:30	5:30	7:30	9:30	11:30
E.55th St. / Euclid	Dep.	9:38	11:38	1:38	3:38	5:38	7:38	9:38	11:38
E.88th St. / Union	Dep.	9:43	11:43	1:43	3:43	5:43	7:43	9:43	11:43
Garfield Heights	Dep.	9:51	11:51	1:51	3:51	5:51	7:51	9:51	11:51
Bedford	Dep.	9:56	11:56	1:56	3:56	5:56	7:56	9:56	11:56
Glenwillow	Dep.	10:09	12:09	2:09	4:09	6:09	8:09	10:09	12:09
Twinsburg	Dep.	10:15	12:15	2:15	4:15	6:15	8:15	10:15	12:15
Streetsboro	Dep.	10:23	12:23	2:23	4:23	6:23	8:23	10:23	12:23
Kent	Arr.	10:32	12:32	2:32	4:32	6:32	8:32	10:32	12:32
Tallmadge	Arr.	10:56	12:56	2:56	4:56	6:56	8:56	10:56	12:56
Akron	Arr.	11:04	1:04	3:04	5:04	7:04	9:04	11:04	1:04
	Dep.	11:11	1:11	3:11	5:11	7:11	9:11	11:11	1:11
South Akron	Dep.	11:21	1:21	3:21	5:21	7:21	9:21	11:21	1:21
Myersville / Uniontown	Dep.	11:28	1:28	3:28	5:28	7:28	9:28	11:28	1:28
Akron-Canton Airport	Dep.	11:36	1:36	3:36	5:36	7:36	9:36	11:36	1:36
N. Canton-Belden Village	Dep.	11:42	1:42	3:42	5:42	7:42	9:42	11:42	1:42
Football Hall of Fame	Dep.	11:48	1:48	3:48	5:48	7:48	9:48	11:48	1:48
Canton	Arr.	11:52	1:52	3:52	5:52	7:52	9:52	11:52	1:52
		A.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	A.M.

Example Only

NEO RAIL ROUTE 6
SOUTHEAST CORRIDOR

Service Option **1**

WEEKDAYS
WESTBOUND

Read Down	Mileage	TRAIN NUMBERS	601	603	605
			A.M.	A.M.	A.M.
Mantua	0.0	**Dep.**	**5:51**	**6:36**	**7:26**
Aurora	5.8	Dep.	6:00	6:45	7:35
Bainbridge-Sea World	8.5	Dep.	6:05	6:50	7:40
Geauga Lake-Six Flags	9.5	Dep.	-	-	-
Solon	13.1	Dep.	6:12	6:57	7:47
Harper Road	15.1	Dep.	6:17	7:02	7:52
N.Randall/Bedford Hts.	18.7	Dep.	6:24	7:09	7:59
E.131st / Miles	22.1	Dep.	6:28	7:13	8:03
E.88th St. / Union	24.2	Dep.	6:32	7:17	8:07
E.55th St. / Euclid	26.3	Dep.	6:37	7:22	8:12
Cleveland - North Coast	30.7	**Arr.**	**6:45**	**7:30**	**8:20**
			A.M.	A.M.	A.M.

EASTBOUND

Read Down	Mileage	TRAIN NUMBERS	600	602	604
			P.M.	P.M.	P.M.
Cleveland - North Coast	0.0	**Dep.**	**4:25**	**5:15**	**6:30**
E.55th St. / Euclid	4.4	Dep.	4:33	5:23	6:38
E.88th St. / Union	6.5	Dep.	4:38	5:28	6:43
E.131st / Miles	8.6	Dep.	4:42	5:32	6:47
N.Randall/Bedford Hts.	12.0	Dep.	4:46	5:36	6:51
Harper Road	15.6	Dep.	4:53	5:43	6:58
Solon	17.6	Dep.	4:57	5:47	7:02
Geauga Lake-Six Flags	21.2	Dep.	-	-	-
Bainbridge-Sea World	22.2	Dep.	5:04	5:54	7:09
Aurora	24.9	Dep.	5:09	5:59	7:14
Mantua	30.7	**Arr.**	**5:18**	**6:08**	**7:23**
			P.M.	P.M.	P.M.

Estimated Performance in year 2025
Level of Service Option 1:
Rush hour service to Cleveland only -- 3 daily round trips.

Daily ridership (trips): 1,400
Capital cost (2001 dollars): $128 million

NEO RAIL ROUTE 6
SOUTHEAST CORRIDOR

Service Option **2**

WEEKDAYS
WESTBOUND

Read Down	TRAIN NUMBERS	601	603	605	607	609	611
		A.M.	A.M.	A.M.	A.M.	P.M.	P.M.
Mantua	**Dep.**	**5:51**	**6:21**	**7:06**	**7:51**	**1:01**	**5:25**
Aurora	Dep.	6:00	6:30	7:15	8:00	1:10	5:34
Bainbridge-Sea World	Dep.	6:05	6:35	7:20	8:05	1:15	5:39
Geauga Lake-Six Flags	Dep.	-	-	-	-	1:18	5:42
Solon	Dep.	6:12	6:42	7:27	8:12	1:23	5:47
Harper Road	Dep.	6:17	6:47	7:32	8:17	1:28	5:52
N.Randall/Bedford Hts.	Dep.	6:24	6:54	7:39	8:24	1:35	5:59
E.131st / Miles	Dep.	6:28	6:58	7:43	8:28	1:39	6:03
E.88th St. / Union	Dep.	6:32	7:02	7:47	8:32	1:43	6:07
E.55th St. / Euclid	Dep.	6:37	7:07	7:52	8:37	1:48	6:12
Cleveland - North Coast	**Arr.**	**6:45**	**7:15**	**8:00**	**8:45**	**1:56**	**6:20**
		A.M.	A.M.	A.M.	A.M.	P.M.	P.M.

EASTBOUND

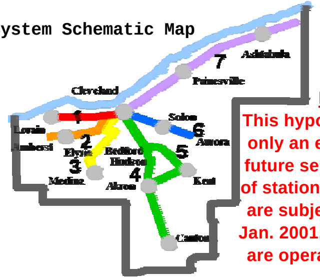
Read Down	TRAIN NUMBERS	600	602	604	606	608	610
		A.M.	P.M.	P.M.	P.M.	P.M.	P.M.
Cleveland - North Coast	**Dep.**	**6:55**	**12:05**	**4:25**	**5:05**	**5:50**	**6:30**
E.55th St. / Euclid	Dep.	7:03	12:13	4:33	5:13	5:58	6:38
E.88th St. / Union	Dep.	7:08	12:18	4:38	5:18	6:03	6:43
E.131st / Miles	Dep.	7:12	12:22	4:42	5:22	6:07	6:47
N.Randall/Bedford Hts.	Dep.	7:16	12:26	4:46	5:26	6:11	6:51
Harper Road	Dep.	7:23	12:33	4:53	5:33	6:18	6:58
Solon	Dep.	7:27	12:37	4:57	5:37	6:22	7:02
Geauga Lake-Six Flags	Dep.	7:32	12:42	-	-	-	-
Bainbridge-Sea World	Dep.	7:35	12:45	5:04	5:44	6:29	7:09
Aurora	Dep.	7:40	12:50	5:09	5:49	6:34	7:14
Mantua	**Arr.**	**7:49**	**12:59**	**5:18**	**5:58**	**6:43**	**7:23**
		A.M.	A.M.	A.M.	A.M.	A.M.	P.M.

Estimated Performance in year 2025
Level of Service Option 2:
Rush hour and limited off-peak service -- 6 daily round trips.

Daily ridership (trips): 3,900
Capital cost (2001 dollars): $166 million

NEO RAIL NORTHEAST OHIO COMMUTER RAIL

System Schematic Map



Disclaimer:
This hypothetical timetable is only an example of potential future service. The locations of stations and times of trains are subject to change. As of Jan. 2001, no commuter trains are operating on these lines.

Facts & Figures
Route 6 ● Southeast Corridor

Total length of route is 31 miles. Most of route follows lightly used NS Randall Secondary line. Inner 6 miles closest to Cleveland requires construction of a new passenger track parallel to the NS main line.

Transfer at E.55th/Euclid to Euclid Ave buses & University Circle
Transfer at E.88th/Union for NEORail Akron line (Route 4 or 5).
Service subject to negotiated agreement w/ freight railroad right-of-way owners.

Sample Fares to Cleveland

	One-way	Monthly
E.55th St. / Euclid	#REF!	#REF!
E.88th St. / Union	#REF!	#REF!
E.131st / Miles	#REF!	#REF!
N.Randall/Bedford Hts.	#REF!	#REF!
Harper Road	#REF!	#REF!
Solon	#REF!	#REF!
Geauga Lake-Six Flags	#REF!	#REF!
Bainbridge-Sea World	#REF!	#REF!
Aurora	#REF!	#REF!
Mantua	#REF!	#REF!

Would you ride any of these trains?
If so (or if not), please fill out a questionnaire form telling us which trains you'd ride, and whether you would use the service for trips to work, school, sporting or other special events or other purposes.
Or, contact us at the study's web site: **www.pb4d.com/neorail**

NEORail Study Phase II Northeast Ohio Commuter Rail Feasibility Study
Northeast Ohio Commuter Rail Feasibility Study

AMATS SCATS NOACA

NEO RAIL NORTHEAST OHIO COMMUTER RAIL

ROUTE **6**

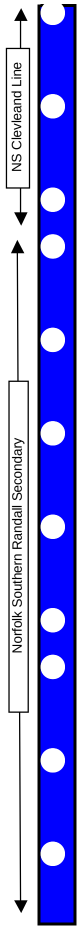
SOUTHEAST CORRRIDOR

Cleveland
Solon
Aurora
Mantua

Serving Cuyahoga, Geauga and Portage Counties

Historic Route of the Erie Railroad

HYPOTHETICAL TIMETABLE



Cleveland-North Coast
E.55th / Euclid
E.88th / Union
E.131st / Miles
N.Randall/Bedford Hts.
Harper Road
Solon
Geauga Lake-Six Flags
Bainbridge-Sea World
Aurora
Mantua

Example Only

NEO RAIL ROUTE 6 -- SOUTHEAST CORRIDOR

LEVEL OF SERVICE 3 -- 12 Daily Round Trips

Service Option **3**

WEEKDAYS
WESTBOUND

Read Down ↓			TRAIN NUMBERS	601	603	605	607	609	611	613	615	401	617	619	621	423	
	Location	Mileage		A.M.	A.M.	A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	
Mantua	SR 44	0.0	**Dep.**	**6:00**	**6:35**	**7:10**	**7:45**	**8:20**	**10:05**	**12:05**	**2:00**	**3:00**	**4:00**	**4:35**	**5:40**	**6:45**	
Aurora	SR 82	5.8	Dep.	6:09	6:44	7:19	7:54	8:29	10:14	12:14	2:09	3:09	4:09	4:44	5:49	6:54	
Bainbridge-Sea World	Brewster Rd.	8.5	Dep.	6:14	6:49	7:24	7:59	8:34	10:19	12:19	2:14	3:14	4:14	4:49	5:54	6:59	
Geauga Lake-Six Flags	At Amusement Park Ent	9.5	Dep.	6:17	6:52	-	8:02	8:37	10:22	12:22	2:17	-	4:17	4:52	5:57	7:02	
Solon	SR 91	13.1	Dep.	6:22	6:57	7:30	8:07	8:42	10:27	12:27	2:22	3:20	4:22	4:57	6:02	7:07	
Harper Road	Harper Road	15.1	Dep.	6:27	7:02	7:35	8:12	8:47	10:32	12:32	2:27	3:25	4:27	5:02	6:07	7:12	
N.Randall/Bedford Hts.	Warrensville Ctr. Rd.	18.7	Dep.	6:34	7:09	7:42	8:19	8:54	10:39	12:39	2:34	3:32	4:34	5:09	6:14	7:19	
E.131st / Miles	E.131st St. & Miles A	22.1	Dep.	6:37	7:12	7:45	8:22	8:57	10:42	12:42	2:37	3:35	4:37	5:12	6:17	7:22	
E.88th St. / Union	Union Ave.	24.2	Dep.	6:41	7:16	7:49	8:26	9:01	10:46	12:46	2:41	3:39	4:41	5:16	6:21	7:26	
E.55th St. / Euclid	Euclid Ave. & E.55th	26.3	Dep.	6:46	7:21	7:54	8:31	9:06	10:51	12:51	2:46	3:44	4:46	5:21	6:26	7:31	
Cleveland - North Coast	North Coast Transp. C W.3rd to E.9th Sts.	30.7	**Arr.**	**6:54** A.M.	**7:29** A.M.	**8:02** A.M.	**8:39** A.M.	**9:14** A.M.	**10:59** A.M.	**12:59** P.M.	**2:54** P.M.	**3:52** P.M.	**4:54** P.M.	**5:29** P.M.	**6:34** P.M.	**7:39** P.M.	

EASTBOUND

Read Down ↓		TRAIN NUMBERS	600	602	604	606	608	610	612	614	616	618	620	622	624	626
	Mileage		A.M.	A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M.	P.M.	A.M.	P.M.	P.M.	P.M.	P.M.
Cleveland - North Coast	0.0	**Dep.**	**7:10**	**7:45**	**8:20**	**8:50**	**10:00**	**12:01**	**2:00**	**4:00**	**4:30**	**5:10**	**5:45**	**6:45**	**8:00**	**11:00**
E.55th St. / Euclid	4.4	Dep.	7:18	7:53	8:28	8:58	10:08	12:09	2:08	4:08	4:38	5:18	5:53	6:53	8:08	11:08
E.88th St. / Union	6.5	Dep.	7:23	7:58	8:33	9:03	10:13	12:14	2:13	4:13	4:43	5:23	5:58	6:58	8:13	11:13
E.131st / Miles	8.6	Dep.	7:27	8:02	8:37	9:07	10:17	12:18	2:17	4:17	4:47	5:27	6:02	7:02	8:17	11:17
N.Randall/Bedford Hts.	12.0	Dep.	7:30	8:05	8:40	9:10	10:20	12:21	2:20	4:20	4:50	5:30	6:05	7:05	8:20	11:20
Harper Road	15.6	Dep.	7:37	8:12	8:47	9:17	10:27	12:28	2:27	4:27	4:57	5:37	6:12	7:12	8:27	11:27
Solon	17.6	Dep.	7:41	8:16	8:51	9:21	10:31	12:32	2:31	4:31	5:01	5:41	6:16	7:16	8:31	11:31
Geauga Lake-Six Flags	21.2	Dep.	-	8:21	-	9:26	10:36	12:37	2:36	-	5:06	5:46	6:21	7:21	8:36	11:36
Bainbridge-Sea World	22.2	Dep.	-	8:25	8:58	9:30	10:40	12:41	2:40	4:38	5:10	5:50	6:25	7:25	8:40	11:40
Aurora	24.9	Dep.	7:52	8:30	9:03	9:35	10:45	12:46	2:45	4:43	5:15	5:55	6:30	7:30	8:45	11:45
Mantua	30.7	Arr.	**8:01** A.M.	**8:39** A.M.	**9:12** A.M.	**9:44** A.M.	**10:54** A.M.	**12:55** P.M.	**2:54** P.M.	**4:52** P.M.	**5:24** P.M.	**6:04** A.M.	**6:39** P.M.	**7:39** P.M.	**8:54** P.M.	**11:54** P.M.

Estimated Performance in year 2025

Level of Service Option 3:

Full service -- rush hour to Cleveland, reverse peak and bi-hourly off-peak -- 24 daily round trips.
Requires 3 trainsets to operate this service to Aurora, 4 to Mantua.

Daily ridership (trips): 4,000
Capital cost (2001 dollars): $190 million

NEO RAIL ROUTE 6 -- SOUTHEAST CORRIDOR

LEVEL OF SERVICE 3 -- 8 Daily Round Trips on Weekends

Service Option **3**

SATURDAYS, SUNDAYS AND HOLIDAYS
WESTBOUND

Read Down ↓	TRAIN NUMBERS	650	652	654	656	658	660	662	415
		A.M.	A.M.	A.M.	P.M.	P.M.	P.M.	P.M.	P.M.
Mantua	**Dep.**	**7:46**	**9:46**	**11:46**	**1:46**	**3:46**	**5:46**	**7:46**	**9:46**
Aurora	Dep.	7:55	9:55	11:55	1:55	3:55	5:55	7:55	9:55
Bainbridge-Sea World	Dep.	8:00	10:00	12:00	2:00	4:00	6:00	8:00	10:00
Geauga Lake-Six Flags	Dep.	8:03	10:03	12:03	2:03	4:03	6:03	8:03	10:03
Solon	Dep.	8:08	10:08	12:08	2:08	4:08	6:08	8:08	10:08
Harper Road	Dep.	8:13	10:13	12:13	2:13	4:13	6:13	8:13	10:13
N.Randall/Bedford Hts.	Dep.	8:20	10:20	12:20	2:20	4:20	6:20	8:20	10:20
E.131st / Miles	Dep.	8:23	10:23	12:23	2:23	4:23	6:23	8:23	10:23
E.88th St. / Union	Dep.	8:27	10:27	12:27	2:27	4:27	6:27	8:27	10:27
E.55th St. / Euclid	Dep.	8:32	10:32	12:32	2:32	4:32	6:32	8:32	10:32
Cleveland - North Coast	**Arr.**	**8:40** A.M.	**10:40** A.M.	**12:40** P.M.	**2:40** P.M.	**4:40** P.M.	**6:40** P.M.	**8:40** P.M.	**10:40** P.M.

EASTBOUND

Read Down ↓	TRAIN NUMBERS	650	652	654	656	658	660	662	664
		A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M.	P.M.
Cleveland - North Coast	**Dep.**	**6:42**	**7:40**	**9:40**	**11:40**	**1:40**	**3:40**	**5:40**	**7:40**
E.55th St. / Euclid	Dep.	6:50	7:48	9:48	11:48	1:48	3:48	5:48	7:48
E.88th St. / Union	Dep.	6:55	7:53	9:53	11:53	1:53	3:53	5:53	7:53
E.131st / Miles	Dep.	6:59	7:57	9:57	11:57	1:57	3:57	5:57	7:57
N.Randall/Bedford Hts.	Dep.	7:02	8:00	10:00	12:00	2:00	4:00	6:00	8:00
Harper Road	Dep.	7:09	8:07	10:07	12:07	2:07	4:07	6:07	8:07
Solon	Dep.	7:13	8:11	10:11	12:11	2:11	4:11	6:11	8:11
Geauga Lake-Six Flags	Dep.	7:18	8:16	10:16	12:16	2:16	4:16	6:16	8:16
Bainbridge-Sea World	Dep.	7:22	8:20	10:20	12:20	2:20	4:20	6:20	8:20
Aurora		7:27	8:25	10:25	12:25	2:25	4:25	6:25	8:25
Mantua	Arr.	**7:36** A.M.	**8:34** A.M.	**10:34** A.M.	**12:34** P.M.	**2:34** P.M.	**4:34** P.M.	**6:34** P.M.	**8:34** A.M.

Example Only

NEO RAIL ROUTE 7

LAKE EAST CORRIDOR

Service Option **1**

WEEKDAYS
WESTBOUND

TRAIN NUMBERS Read Down ↓	Mileage		701	703	705
			A.M.	A.M.	A.M.
Conneaut	0.0	**Dep.**	-	**6:00**	**6:43**
Ashtabula	14.3	Dep.	-	6:16	6:59
West Ashtabula	16.3	Dep.		6:20	7:03
Geneva	22.7	Dep.	-	6:28	7:11
Madison	28.3	Dep.	-	6:35	7:18
Painesville	39.3	Dep.	**6:15**	6:48	7:31
West Painesville	41.2	Dep.	6:18	6:51	7:34
Mentor	45.1	Dep.	6:23	6:56	7:39
Willoughby	48.9	Dep.	6:29	7:02	7:45
Willowick / Wickliffe	53.2	Dep.	6:35	7:08	7:51
Euclid	55.9	Dep.	6:40	7:13	7:56
East Cleveland / Bratenahl	60.7	Dep.	6:51	7:24	8:07
Cleveland - North Coast	67.2	**Arr.**	**6:59**	**7:32**	**8:15**
			A.M.	A.M.	A.M.

EASTBOUND

TRAIN NUMBERS Read Down ↓	Mileage		700	702	704
			P.M.	P.M.	P.M.
Cleveland - North Coast	0.0	**Dep.**	**4:15**	**5:10**	**6:05**
East Cleveland / Bratenahl	6.5	Dep.	4:23	5:18	6:13
Euclid	11.3	Dep.	4:34	5:29	6:24
Willowick / Wickliffe	14.0	Dep.	4:39	5:34	6:29
Willoughby	18.3	Dep.	4:45	5:40	6:35
Mentor	22.1	Dep.	4:51	5:46	6:41
West Painesville	26.0	Dep.	4:56	5:51	6:46
Painesville	27.9	Dep.	4:59	5:54	6:49
Madison	38.9	Dep.	-	6:07	7:02
Geneva	44.5	Dep.	-	6:14	7:09
West Ashtabula	50.9	Dep.	-	6:22	7:17
Ashtabula	52.9	Dep.	-	6:26	7:21
Conneaut	67.2	**Arr.**	**-**	**6:42**	**7:37**
			P.M.	P.M.	P.M.

Estimated Performance in year 2025
Level of Service Option 1:
Rush hour service to Cleveland only -- 3 daily round trips.

Daily ridership (trips): 900 to Mentor only.
Capital cost (2001 dollars): $140 million to mentor only.

NEO RAIL ROUTE 7

LAKE EAST CORRIDOR

Service Option **2**

WEEKDAYS
WESTBOUND

TRAIN NUMBERS Read Down ↓		701	703	705	707	709	711
		A.M.	A.M.	A.M.	A.M.	P.M.	P.M.
Conneaut	**Dep.**	-	**6:00**	**6:43**	-	-	-
Ashtabula	Dep.	-	6:16	6:59	-	-	-
West Ashtabula	Dep.		6:20	7:03			
Geneva	Dep.	-	6:28	7:11	-	-	-
Madison	Dep.	-	6:35	7:18	-	-	-
Painesville	Dep.	**6:15**	6:48	7:31	**8:10**	**1:15**	**5:05**
West Painesville	Dep.	6:18	6:51	7:34	8:13	1:18	5:08
Mentor	Dep.	6:23	6:56	7:39	8:18	1:23	5:13
Willoughby	Dep.	6:29	7:02	7:45	8:24	1:29	5:19
Willowick / Wickliffe	Dep.	6:35	7:08	7:51	8:30	1:35	5:25
Euclid	Dep.	6:40	7:13	7:56	8:35	1:40	5:30
East Cleveland / Bratenahl	Dep.	6:51	7:24	8:07	8:46	1:51	5:41
Cleveland - North Coast	**Arr.**	**6:59**	**7:32**	**8:15**	**8:54**	**1:59**	**5:49**
		A.M.	A.M.	A.M.	A.M.	P.M.	P.M.

EASTBOUND

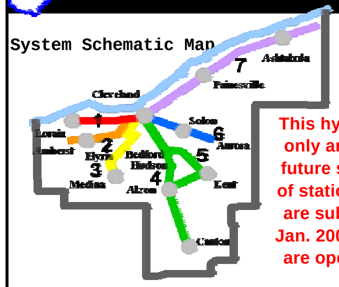
TRAIN NUMBERS Read Down ↓		700	702	704	706	708	710
		A.M.	P.M.	P.M.	P.M.	P.M.	P.M.
Cleveland - North Coast	**Dep.**	**7:15**	**12:15**	**4:10**	**4:45**	**5:30**	**6:15**
East Cleveland / Bratenahl	Dep.	7:23	12:23	4:18	4:53	5:38	6:23
Euclid	Dep.	7:34	12:34	4:29	5:04	5:49	6:34
Willowick / Wickliffe	Dep.	7:39	12:39	4:34	5:09	5:54	6:39
Willoughby	Dep.	7:45	12:45	4:40	5:15	6:00	6:45
Mentor	Dep.	7:51	12:51	4:46	5:21	6:06	6:51
West Painesville	Dep.	7:56	12:56	4:51	5:26	6:11	6:56
Painesville	Dep.	7:59	12:59	4:54	5:29	6:14	6:59
Madison	Dep.	-	-	-	5:42	6:27	-
Geneva	Dep.	-	-	-	5:49	6:34	-
West Ashtabula	Dep.	-	-	-	5:57	6:42	-
Ashtabula	Dep.	-	-	-	6:01	6:46	-
Conneaut	**Arr.**	-	-	-	**6:17**	**7:02**	-
		A.M.	A.M.	P.M.	P.M.	P.M.	P.M.

Estimated Performance in year 2025
Level of Service Option 2:
Rush hour and limited off-peak service -- 6 daily round trips.

Daily ridership (trips): 2,000
Capital cost (2001 dollars): $238 million

NEO RAIL NORTHEAST OHIO COMMUTER RAIL

System Schematic Map



Disclaimer:
This hypothetical timetable is only an example of potential future service. The locations of stations and times of trains are subject to change. As of Jan. 2001, no commuter trains are operating on these lines.

Facts & Figures
Route 7 ● Lake East Corridor

Total length of route is 67 miles, mostly along right-of-way that used to be the 4-track mainline of the New York Central.

Significant travel demand exists only in the first 28 miles east of Cleveland (i.e., Painesville). Major Infrastructure and capacity investments are limited to this area. Service east of Painesville is not cost-effective if significant capacity investments are required by CSX. Service subject to negotiated agreement w/ freight railroad right-of-way owners (CSX Transportation).

Sample Fares to Cleveland

	One-way	Monthly
East Cleveland / Bratenahl	$2.00	$50.00
Euclid	#REF!	#REF!
Willowick / Wickliffe	#REF!	#REF!
Willoughby	#REF!	#REF!
Mentor	#REF!	#REF!
West Painesville	#REF!	#REF!
Painesville	#REF!	#REF!
Madison	#REF!	#REF!
Geneva	#REF!	#REF!
West Ashtabula	#REF!	#REF!
Ashtabula	#REF!	#REF!
Conneaut	#REF!	#REF!

Would you ride any of these trains?
If so (or if not), please fill out a questionnaire form telling us which trains you'd ride, and whether you would use the service for trips to work, school, sporting or other special events or other purposes.
Or, contact us at the study's web site: **www.pb4d.com/neorail**

NEORail Study Phase II
Northeast Ohio Commuter Rail Feasibility Study

PB AMATS SCATS NOACA

NEO RAIL NORTHEAST OHIO COMMUTER RAIL

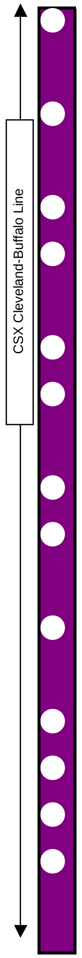
ROUTE
7
LAKE EAST
CORRRIDOR

Cleveland
Painesville
Ashtabula
Conneaut

Serving Cuyahoga, Lake and Ashtabula Counties

Historic Route of the New York Central Railroa

HYPOTHETICAL TIMETABLE



Cleveland

East Cleveland / Bratenahl

Euclid
Willowick / Wickliffe

Willoughby
Mentor

West Painesville
Painesville

Madison

Geneva
West Ashtabula
Ashtabula
Conneaut

Example Only

NEO RAIL ROUTE 7 -- LAKE EAST CORRIDOR

LEVEL OF SERVICE 3 -- 12 Daily Round Trips

Service Option
3

WEEKDAYS
WESTBOUND

Read Down ↓	Location	Mileage	TRAIN NUMBERS	701	703	705	707	709	711	713	715	401	717	719
				A.M.	A.M.	A.M.	A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M.	P.M.
Conneaut	Mill Street	0.0	**Dep.**	**-**	**5:49**	**6:24**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Ashtabula	Station Ave./Lake Ave	14.3	Dep.	-	6:05	6:40	-	-	-	-	-	-	-	-
West Ashtabula	SR 45	16.3	Dep.		6:09	6:44								
Geneva	Broadway	22.7	Dep.	-	6:17	6:52	-	-	-	-	-	-	-	-
Madison	SR 528-Lake Street	28.3	Dep.	-	6:24	6:59	-	-	-	-	-	-	-	-
Painesville	State Street	39.3	Dep.	**6:15**	6:37	7:12	**7:50**	**8:20**	**10:30**	**12:30**	**2:30**	**-**	**5:40**	**7:30**
West Painesville	SR 44	41.2	Arr.	6:18	6:40	7:15	7:53	8:23	10:33	12:33	2:33	**5:00**	5:43	7:33
Mentor	SR 615	45.1	Dep.	6:23	6:45	7:20	7:58	8:28	10:38	12:38	2:38	5:05	5:48	7:38
Willoughby	SR 306	48.9	Dep.	6:29	6:51	7:26	8:04	8:34	10:44	12:44	2:44	5:11	5:54	7:44
Willowick / Wickliffe	E.305th St./Rush Rd.	53.2	Dep.	6:35	6:57	7:32	8:10	8:40	10:50	12:50	2:50	5:17	6:00	7:50
Euclid	E.260th Street	55.9	Dep.	6:40	7:02	7:37	8:15	8:45	10:55	12:55	2:55	5:22	6:05	7:55
East Cleveland / Bratenahl	E.105th Street	60.7	Dep.	6:51	7:13	7:48	8:26	8:56	11:06	13:06	3:06	5:33	6:16	8:06
Cleveland - North Coast	North Coast Transp. C	67.2	**Arr.**	**6:59**	**7:21**	**7:56**	**8:34**	**9:04**	**11:14**	**13:14**	**3:14**	**5:41**	**6:24**	**8:14**
	W.3rd to E.9th Sts.			A.M.	A.M.	A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M.	P.M.	P.M.

EASTBOUND

Read Down ↓	Mileage	TRAIN NUMBERS	700	702	704	706	708	710	712	714	716	718	720	722
			A.M.	A.M.	A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M.	A.M.	P.M.	P.M.
Cleveland - North Coast	0.0	**Dep.**	**6:55**	**7:25**	**9:30**	**11:30**	**1:30**	**4:10**	**4:45**	**5:15**	**6:00**	**6:35**	**8:35**	**11:00**
East Cleveland / Bratenahl	6.5	Dep.	7:03	7:33	9:38	11:38	1:38	4:18	4:53	5:23	6:08	6:43	8:43	11:08
Euclid	11.3	Dep.	7:11	7:41	9:46	11:46	1:46	4:29	5:04	5:34	6:19	6:51	8:51	11:16
Willowick / Wickliffe	14.0	Dep.	7:19	7:49	9:54	11:54	1:54	4:34	5:09	5:39	6:24	6:59	8:59	11:24
Willoughby	18.3	Dep.	7:24	7:54	9:59	11:59	1:59	4:40	5:15	5:45	6:30	7:04	9:04	11:29
Mentor	22.1	Arr.	7:33	8:03	10:08	12:08	2:08	4:46	5:21	5:51	6:36	7:13	9:13	11:38
West Painesville	26.0	Dep.	7:40	8:10	10:15	12:15	2:15	**4:51**	5:26	5:56	6:41	7:20	9:20	11:45
Painesville	27.9	Dep.	**7:50**	**8:20**	**10:25**	**12:25**	**2:25**	-	**5:29**	5:59	6:44	**7:30**	**9:30**	**11:55**
Madison	38.9	Dep.	-	-	-	-	-	-	-	6:12	6:57	-	-	-
Geneva	44.5	Dep.	-	-	-	-	-	-	-	6:19	7:04	-	-	-
West Ashtabula	50.9	Dep.	-	-	-	-	-	-	-	6:27	7:12	-	-	-
Ashtabula	52.9	Dep.	-	-	-	-	-	-	-	6:31	7:16	-	-	-
Conneaut	67.2	**Arr.**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**6:47**	**7:32**	**-**	**-**	**-**
			A.M.	A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.

Estimated Performance in year 2025

Level of Service Option 3:

Full service -- rush hour to Cleveland, reverse peak and bi-hourly off-peak -- 24 daily round trips.
4 trainsets are required to operate this service.

Daily ridership (trips): 3,300
Capital cost (2001 dollars): $246 million

NEO RAIL ROUTE 7 -- LAKE EAST CORRIDOR

LEVEL OF SERVICE 3 -- 8 Daily Round Trips on Weekends

Service Option
3

SATURDAYS, SUNDAYS AND HOLIDAYS
WESTBOUND

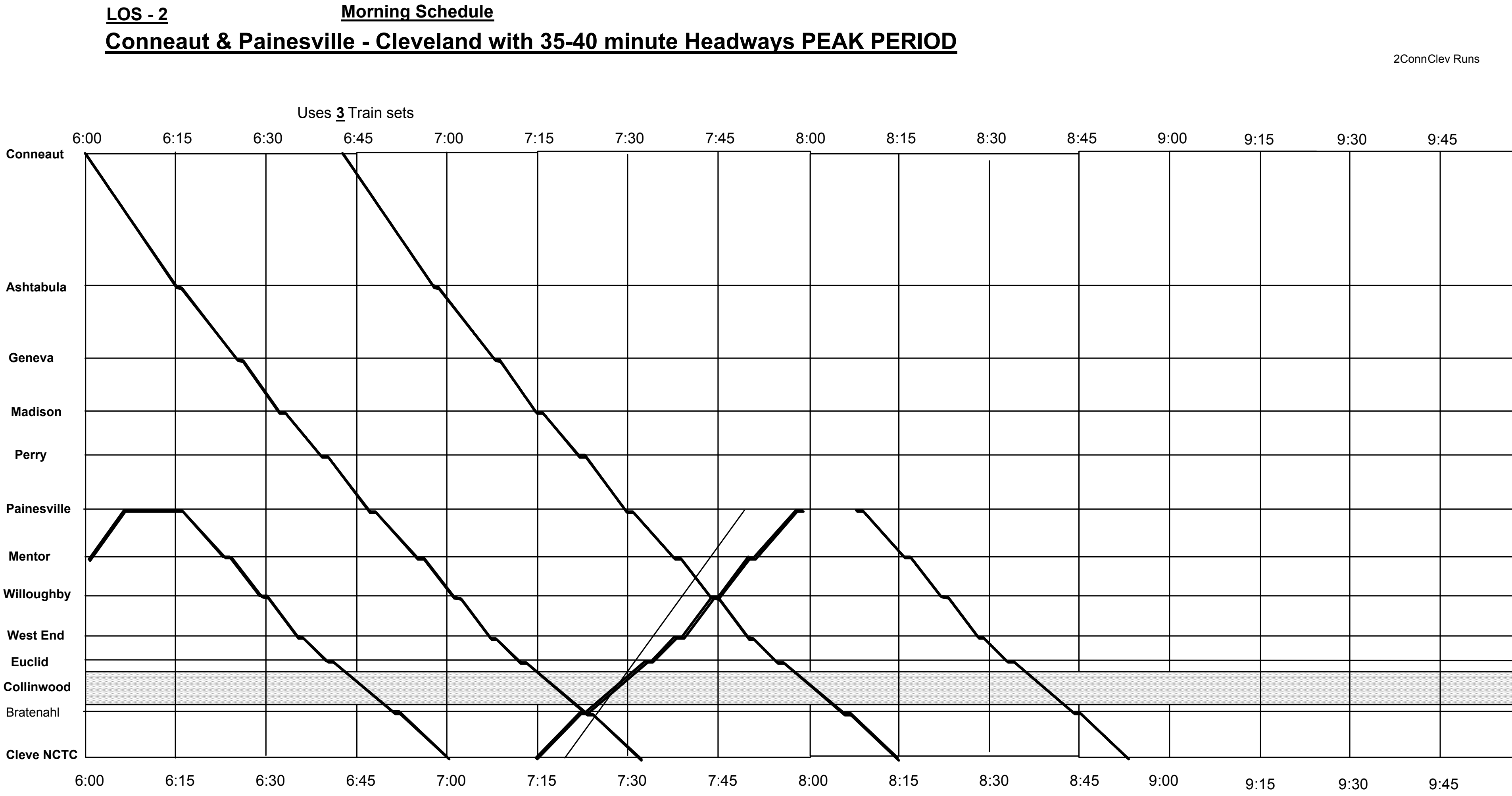
Read Down ↓	TRAIN NUMBERS	751	753	755	757	759	761	763	415
		A.M.	A.M.	A.M.	P.M.	P.M.	P.M.	P.M.	P.M.
Conneaut	**Dep.**	-	**9:12**	-	-	**-**	**-**	**7:12**	**-**
Ashtabula	Dep.	-	9:28	-	-	-	-	7:28	-
West Ashtabula	Dep.	-	9:32	-	-	-	-	7:32	-
Geneva	Dep.	-	9:40	-	-	-	-	7:40	-
Madison	Dep.	-	9:47	-	-	-	-	7:47	-
Painesville	**Dep.**	**8:00**	10:00	**12:00**	**2:00**	**4:00**	**6:00**	8:00	**10:00**
West Painesville	Arr.	8:03	10:03	12:03	2:03	4:03	6:03	8:03	10:03
Mentor	Dep.	8:08	10:08	12:08	2:08	4:08	6:08	8:08	10:08
Willoughby	Dep.	8:14	10:14	12:14	2:14	4:14	6:14	8:14	10:14
Willowick / Wickliffe	Dep.	8:20	10:20	12:20	2:20	4:20	6:20	8:20	10:20
Euclid	Dep.	8:25	10:25	12:25	2:25	4:25	6:25	8:25	10:25
East Cleveland / Bratenahl	Dep.	8:36	10:36	12:36	2:36	4:36	6:36	8:36	10:36
Cleveland - North Coast	**Arr.**	**8:44**	**10:44**	**12:44**	**2:44**	**4:44**	**6:44**	**8:44**	**10:44**
		A.M.	A.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.

EASTBOUND

Read Down ↓	TRAIN NUMBERS	750	752	754	756	758	760	762	764
		A.M.	A.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.
Cleveland - North Coast	**Dep.**	**9:30**	**11:30**	**1:30**	**3:30**	**5:30**	**7:30**	**9:30**	**11:30**
East Cleveland / Bratenahl	Dep.	9:38	11:38	1:38	3:38	5:38	7:38	9:38	11:38
Euclid	Dep.	9:46	11:46	1:46	3:46	5:46	7:46	9:46	11:46
Willowick / Wickliffe	Dep.	9:54	11:54	1:54	3:54	5:54	7:54	9:54	11:54
Willoughby	Dep.	9:59	11:59	1:59	3:59	5:59	7:59	9:59	11:59
Mentor	Arr.	10:08	12:08	2:08	4:08	6:08	8:08	10:08	12:08
West Painesville	Dep.	10:15	12:15	2:15	4:15	6:15	8:15	10:15	12:15
Painesville	Dep.	10:25	12:25	2:25	4:25	6:25	8:25	10:25	12:25
Madison	Dep.	10:38	-	-	-	-	8:38	-	-
Geneva	Dep.	10:45	-	-	-	-	8:45	-	-
West Ashtabula	Dep.	10:53	-	-	-	-	8:53	-	-
Ashtabula	Dep.	10:57	-	-	-	-	8:57	-	-
Conneaut	**Arr.**	**11:13**	**-**	**-**	**-**	**-**	**9:13**	**-**	**-**
		A.M.	A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	A.M.

Example Only

Scenario 2 – Route 7 – Weekday Morning Peak
Level of Service 2, Cleveland-Painesville
Level of Service 1, Painesville-Madison-Conneaut



Scenario 3 – Route 7 – Weekday Morning Peak
Level of Service 3, Cleveland-Painesville
Level of Service 1, Painesville-Madison-Conneaut

Item - 3

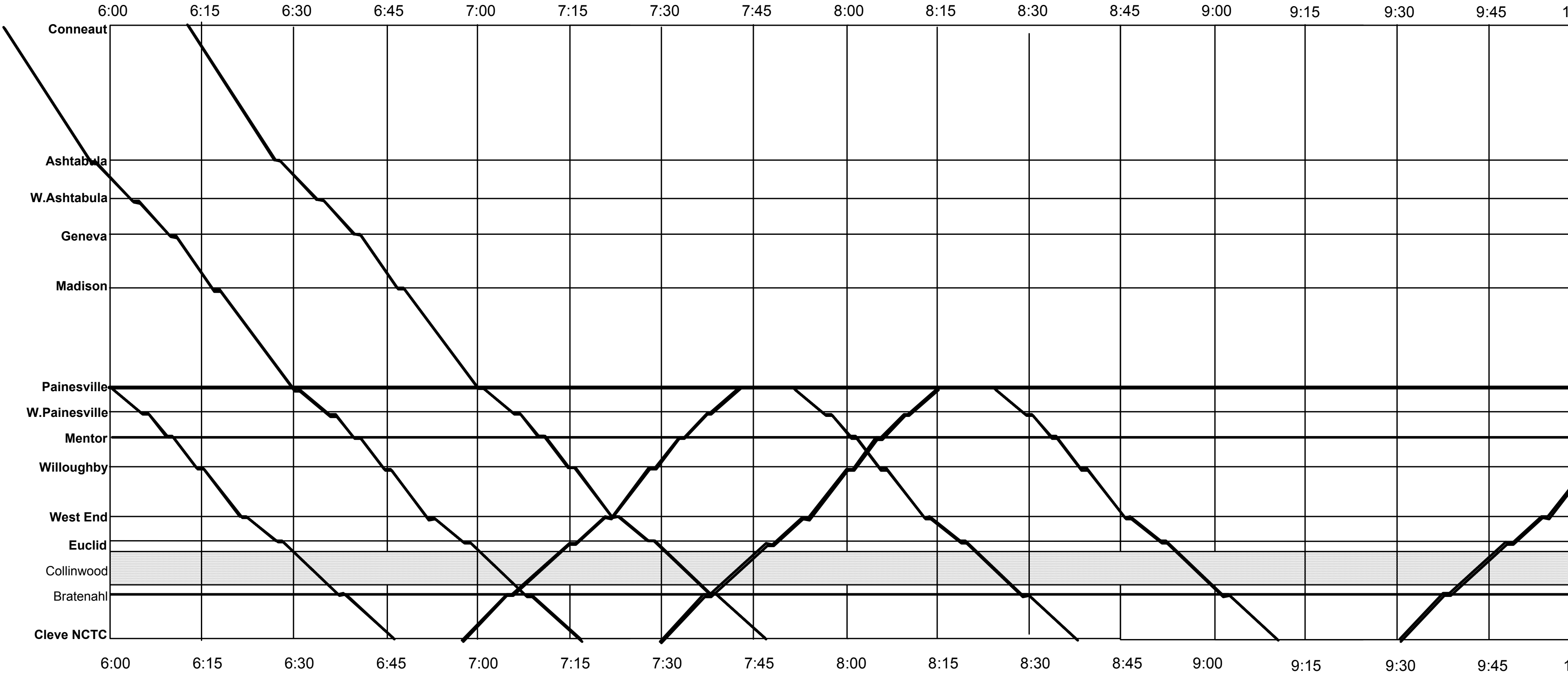
3ConnPvl-Clev3ts

Morning Schedule

LOS - 3

Conneaut / Painesville - Cleveland with 25 minute Headways PEAK PERIOD

Uses **3** Train sets



Scenario 4 – Route 7 – Weekday Morning Peak
Level of Service 3, Cleveland-Madison
Level of Service 1, Madison-Conneaut

Item - 4

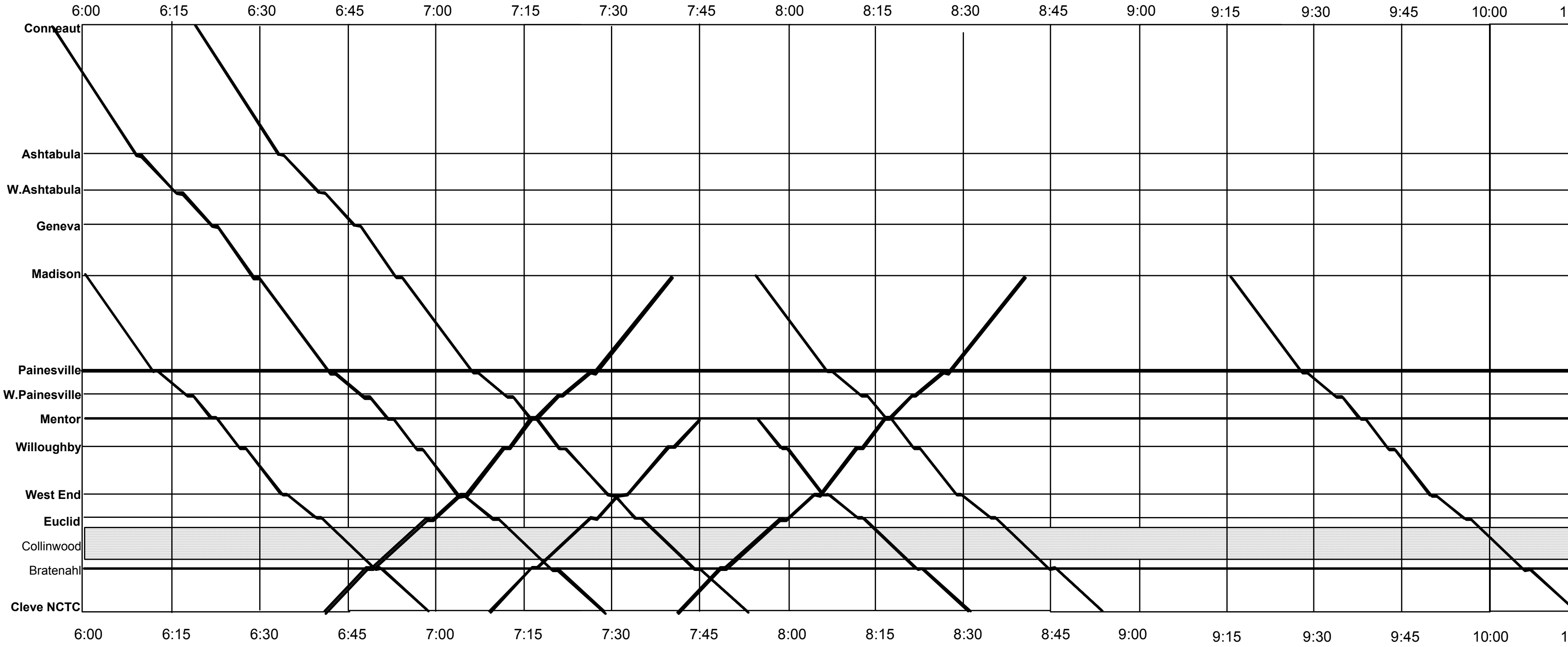
3ConnMad-Clev

Morning Schedule

LOS - 3

Conneaut / Madison - Cleveland with 25 minute Headways PEAK PERIOD

Uses **4** Train sets



Scenario 5 – Route 6 – Level of Service 3 (vs. LOS 2)
Cleveland-Solon-Aurora
Weekday Morning Peak

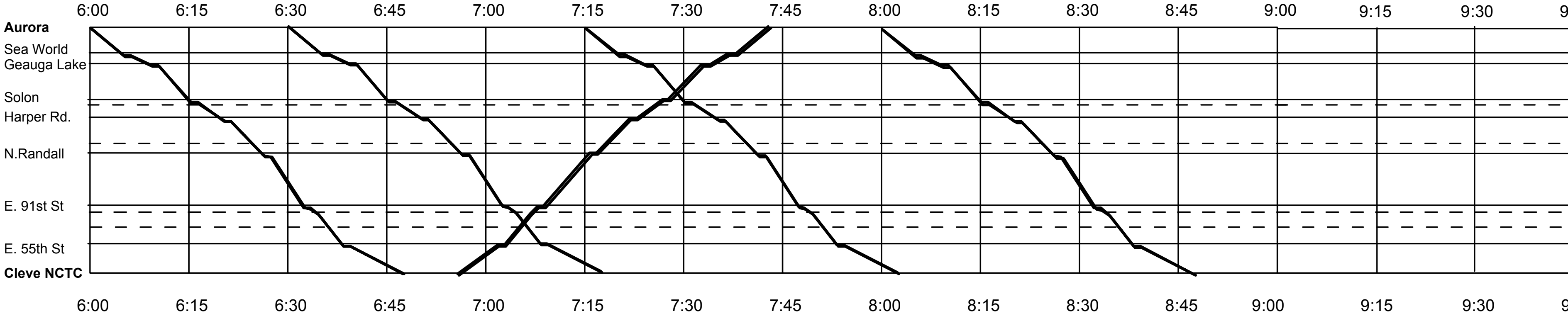
LOS 2

Morning Schedule

2AuroCl

Aurora - Cleveland with 30-45 minute Headways PEAK PERIOD

Uses **3** Train sets



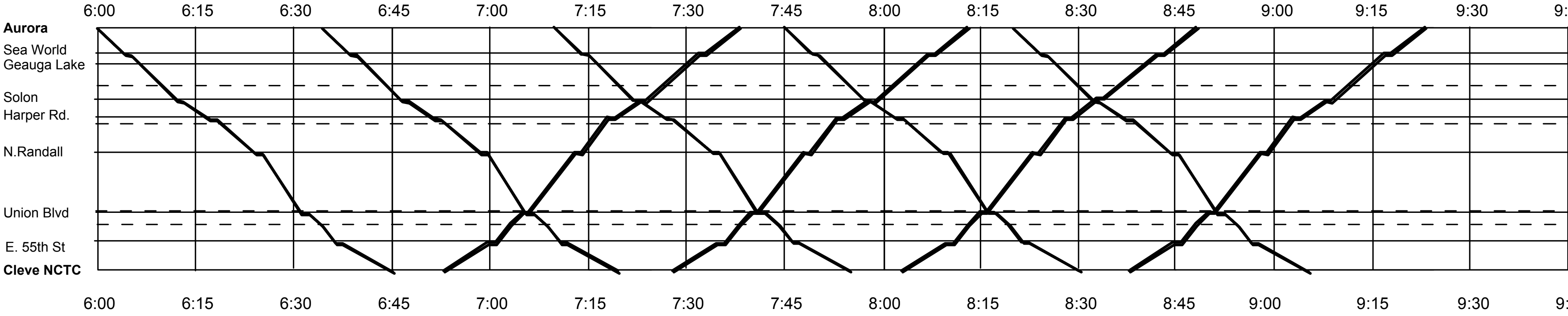
LOS 3

Aurora - Cleveland with 35 minute Headways PEAK PERIOD

3Aur-Clev

Uses **3** Train sets

24 Daily Trains



Scenario 5 – Route 6 – Level of Service 3
Cleveland-Solon-Aurora
Weekday Morning Peak

Item - 5

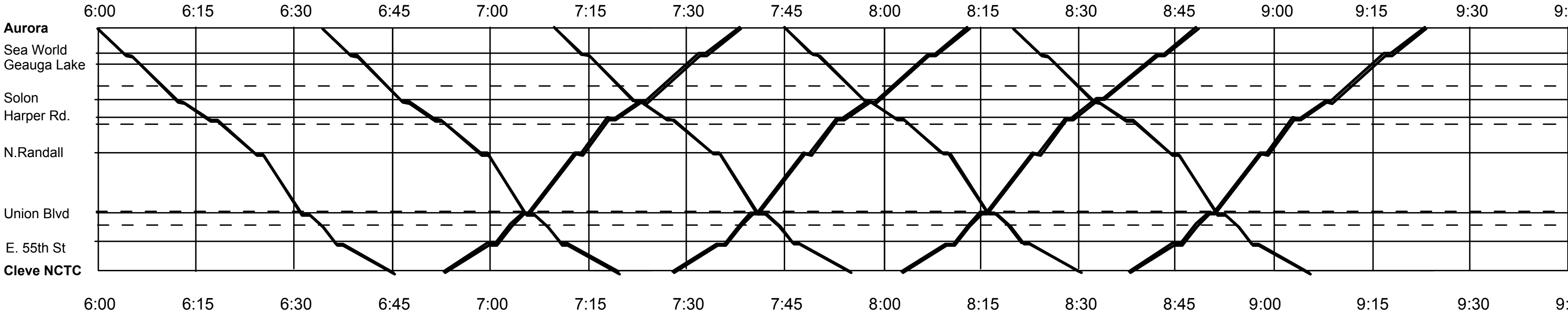
LOS 3

Morning Schedule

Aurora - Cleveland with 35 minute Headways PEAK PERIOD

3Aur-Clev

Uses **3** Train sets
24 Daily Trains



Scenario 6 – Route 6 – Level of Service 3
Cleveland-Solon-Aurora-Mantua
Weekday Morning Peak

Item - 6

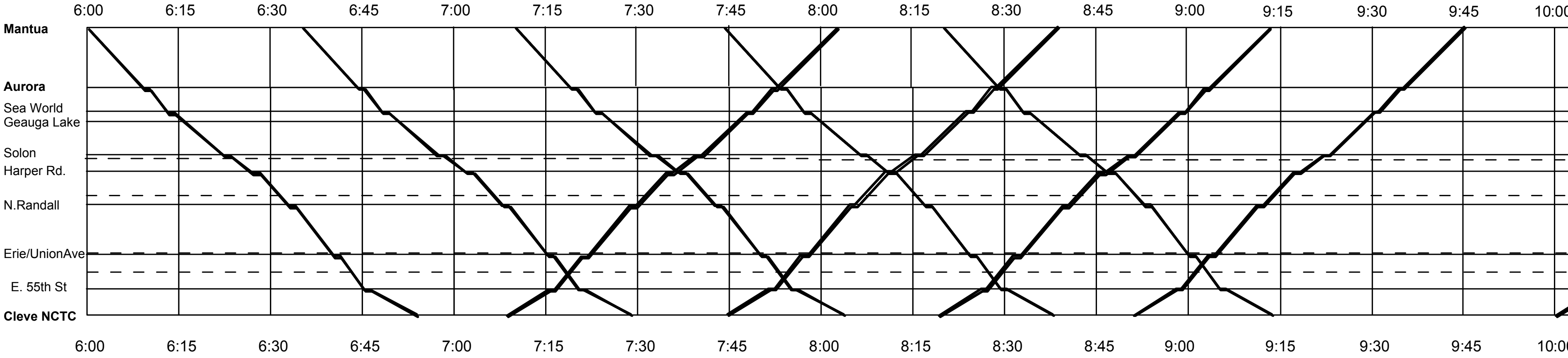
LOS 3+

Morning Schedule

3MantuaClev 35mRev

Mantua & Aurora - Cleveland with 35 minute Headways PEAK PERIOD

With 4 Train sets, the 35 minute interval could be maintained but an additional siding would be required at Aurora



Scenario 9 – Route 6 – Level of Service 3
Cleveland-Aurora w/ Akron trains added
Weekday Morning Peak

Item - 7

LOS 3

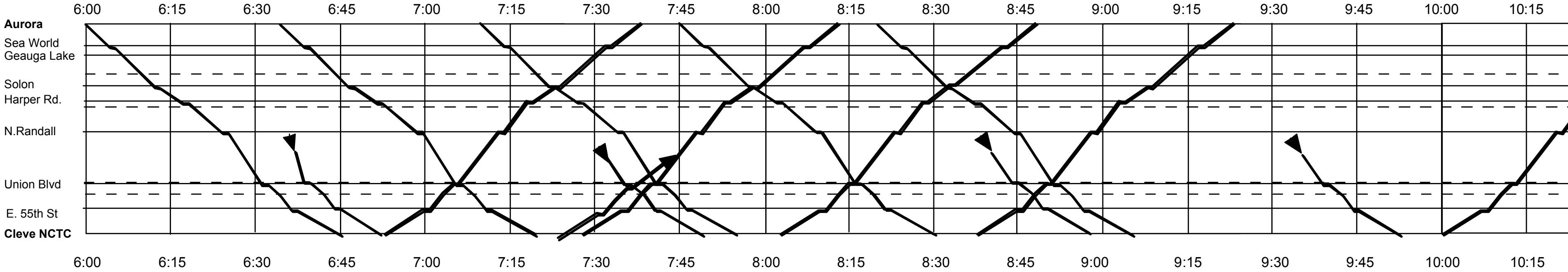
Morning Schedule

Aurora - Cleveland with 35 minute Headways PEAK PERIOD

3Aur-Clev35 Runs wAKR

Uses **3** Train sets

24 Daily Trains



Scenario 12 – Route 4D – Level of Service 2
Cleveland-Hudson-Akron-Canton
Weekday Morning Peak

ITEM - 12

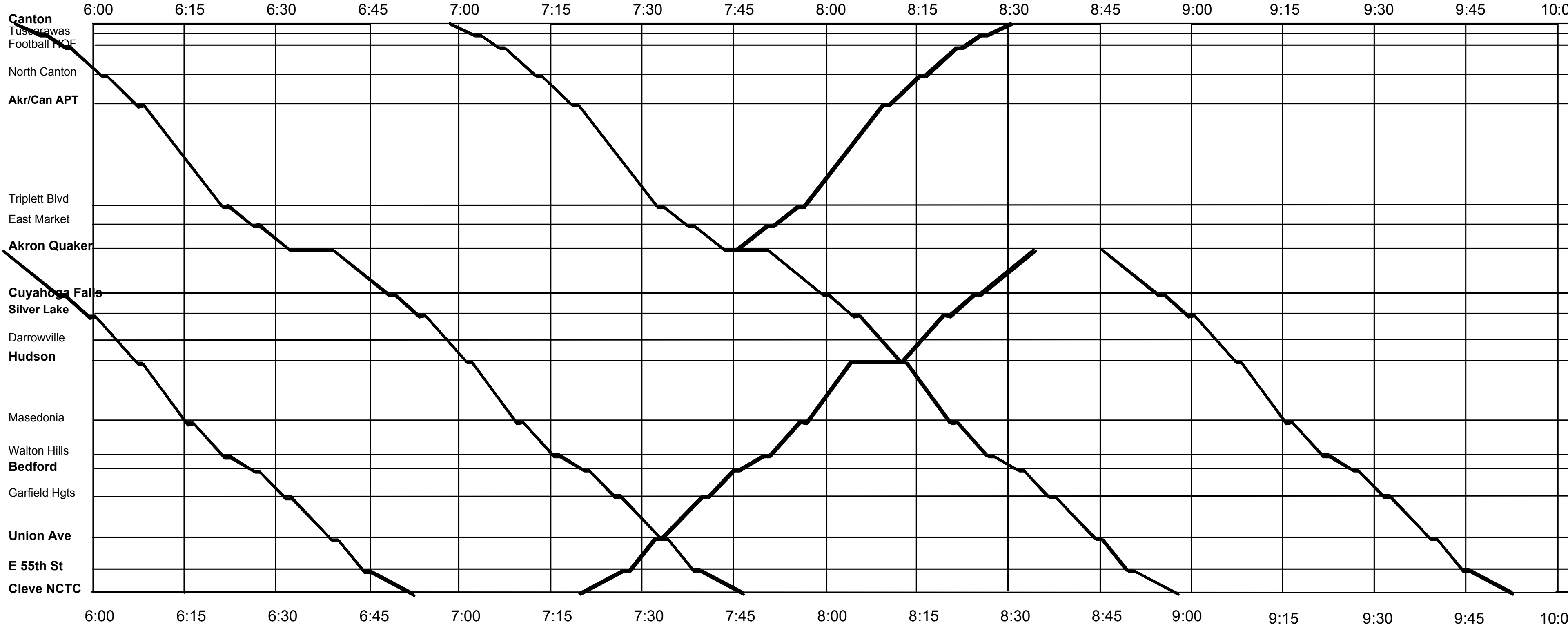
LOS - 2

Morning Schedule

Canton Akron - Cleveland via Hudson with 40+ minute Headways PEAK PERIOD

2Can/Akr-Clev.via Hudson

Uses **3** Train sets



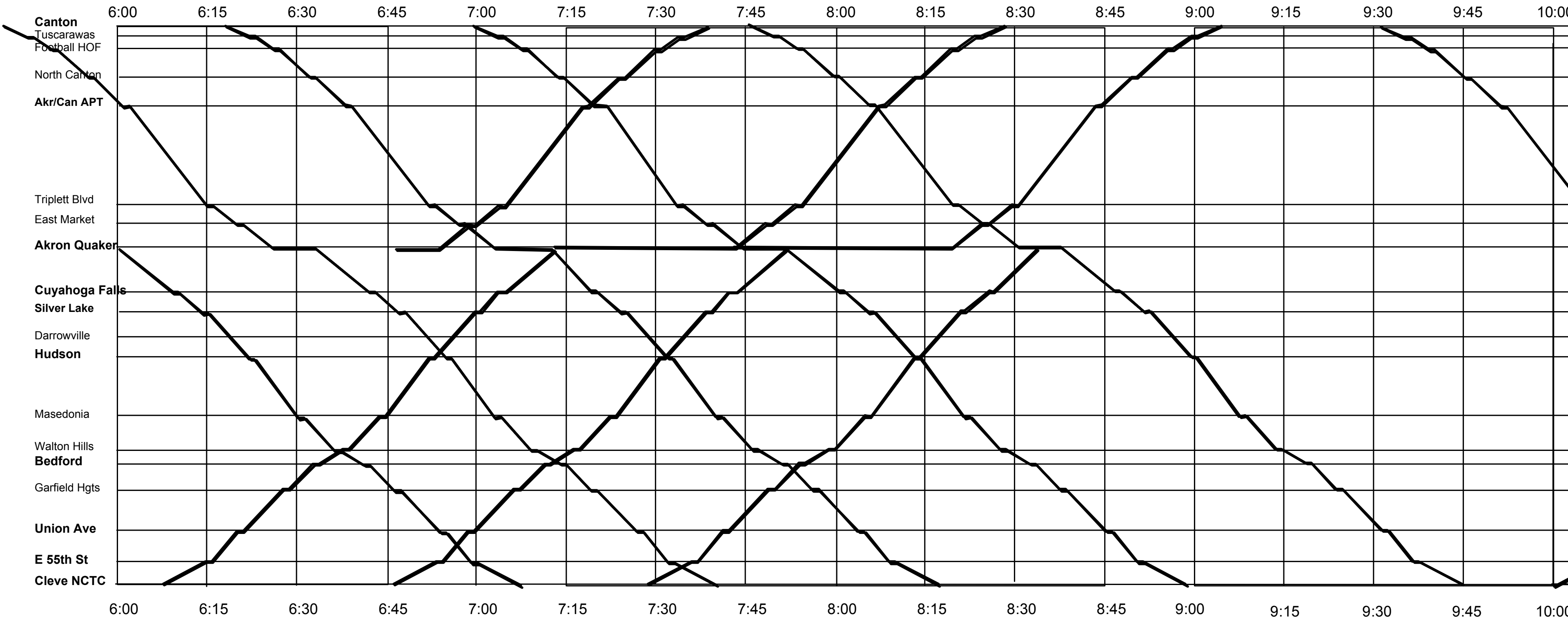
Scenario 18 – Route 4D – Level of Service 3
Cleveland-Hudson-Akron-Canton
Weekday Morning Peak

Item - 18 **LOS - 3** **Morning Schedule**

Canton Akron - Cleveland via Hudson with 35 minute Headways PEAK PERIOD

7 Train Sets

3Can/Akr-Clev.@35via Hud.



Scenario 15 – Route 4E – Level of Service 2
Cleveland-Kent-Akron-Canton
Weekday Morning Peak

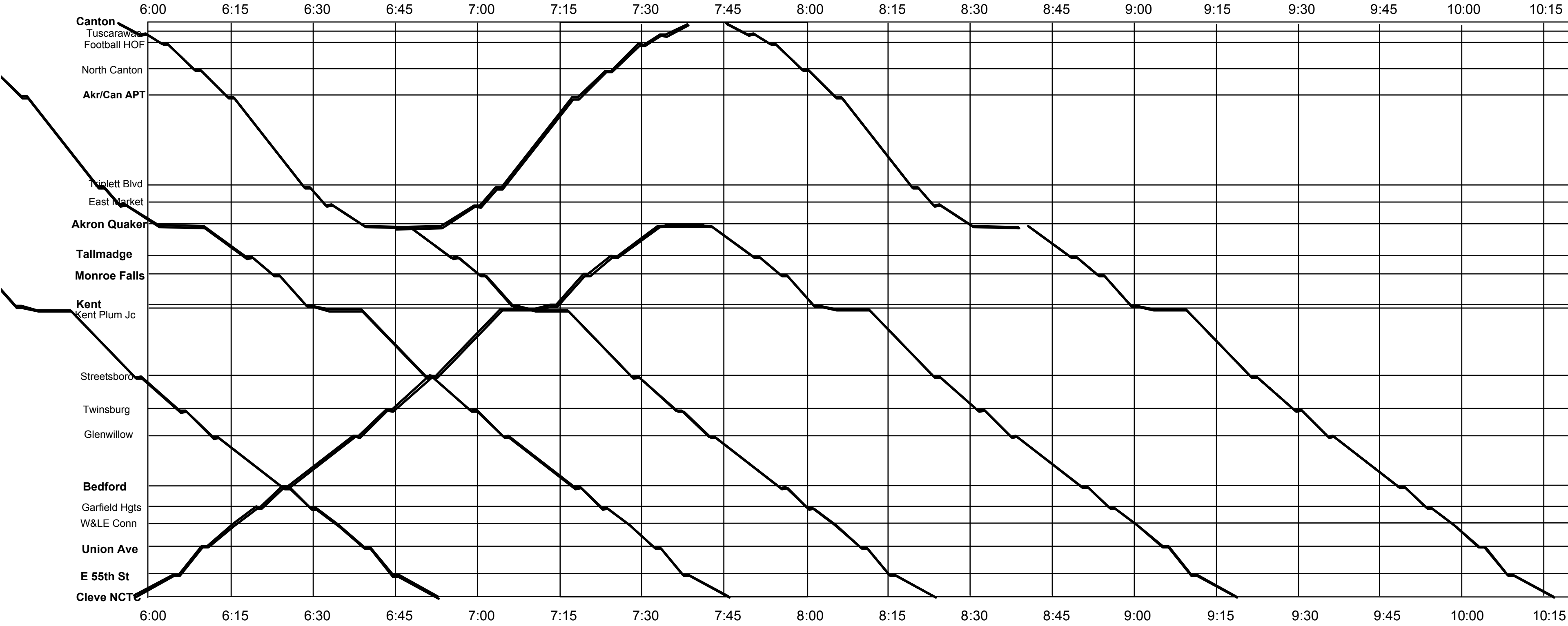
Item - 15R LOS - 2

Morning Schedule

Canton Akron - Cleveland via Kent with 40+ minute Headways PEAK PERIOD

2Can/Akr-Clev.via Kent15

Uses **5** Train sets



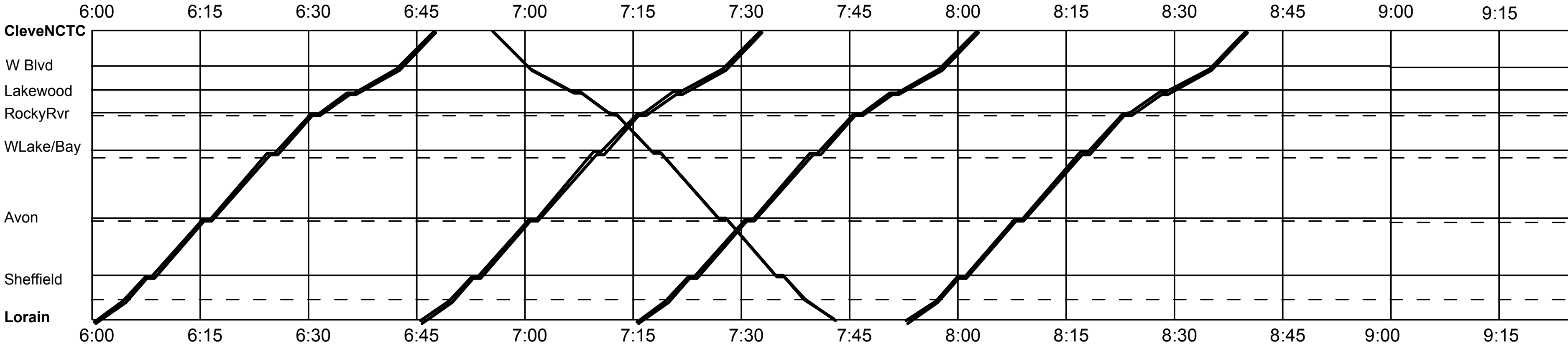
Scenario 23 – Route 1 – Level of Service 2
Cleveland-Lakewood-Lorain
Weekday Morning Peak

LOS - 2

Morning Schedule

Cleveland - Lorain with 30-45 minute Headways PEAK PERIOD

Uses **3** Train sets



Scenario 24 – Route 1 – Level of Service 3
Cleveland-Lakewood-Lorain
Weekday Morning Peak

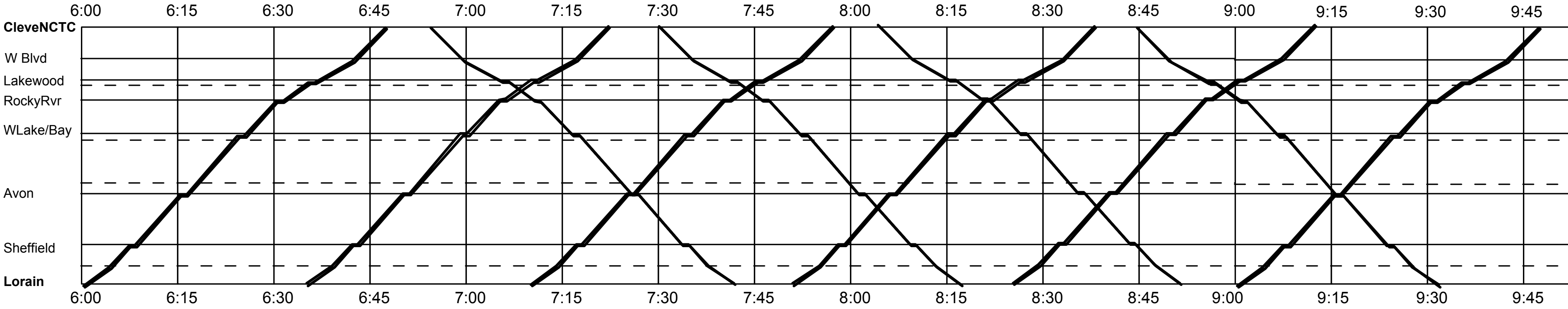
Item - 24

LOS-3 **Morning Schedule**

Cleveland - Lorain with 35 minute Headways PEAK PERIOD

3ClevLorn35

Uses **3** Train sets

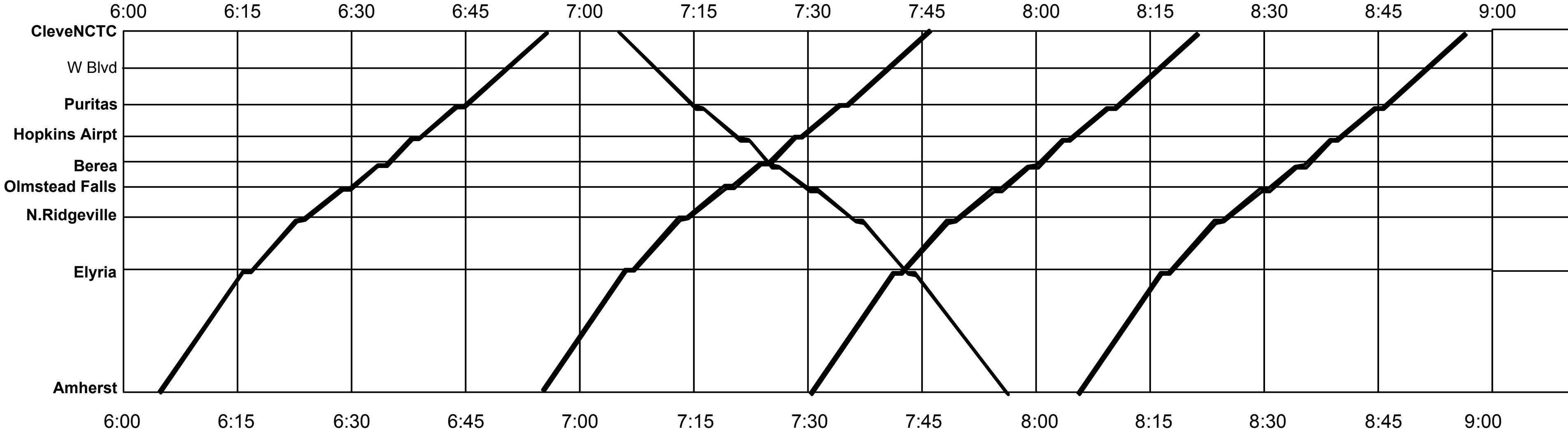


Scenario 27 – Route 2 – Level of Service 2
Cleveland-Elyria-Amherst
Weekday Morning Peak

Morning Schedule

Uses **3** Train sets

Cleveland - Amherst with 30-45 minute Headways PEAK PERIOD



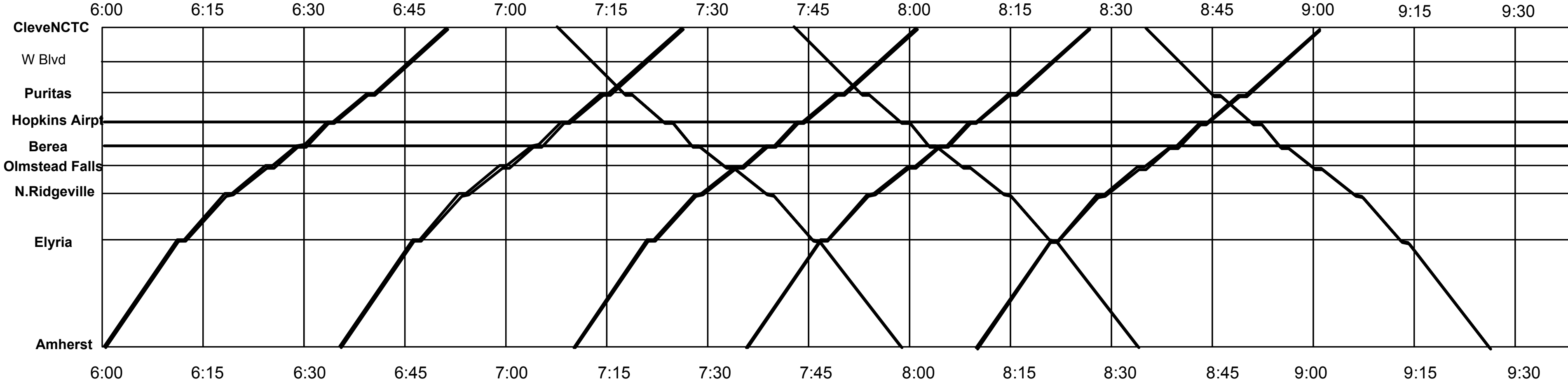
Scenario 29 – Route 2 – Level of Service 3
Cleveland-Elyria-Amherst
Weekday Morning Peak

Item - 29

LOS-3 **Morning Schedule**

Cleveland - Amherst with 35 minute Headways PEAK PERIOD and 4 Reverse Peak Runs

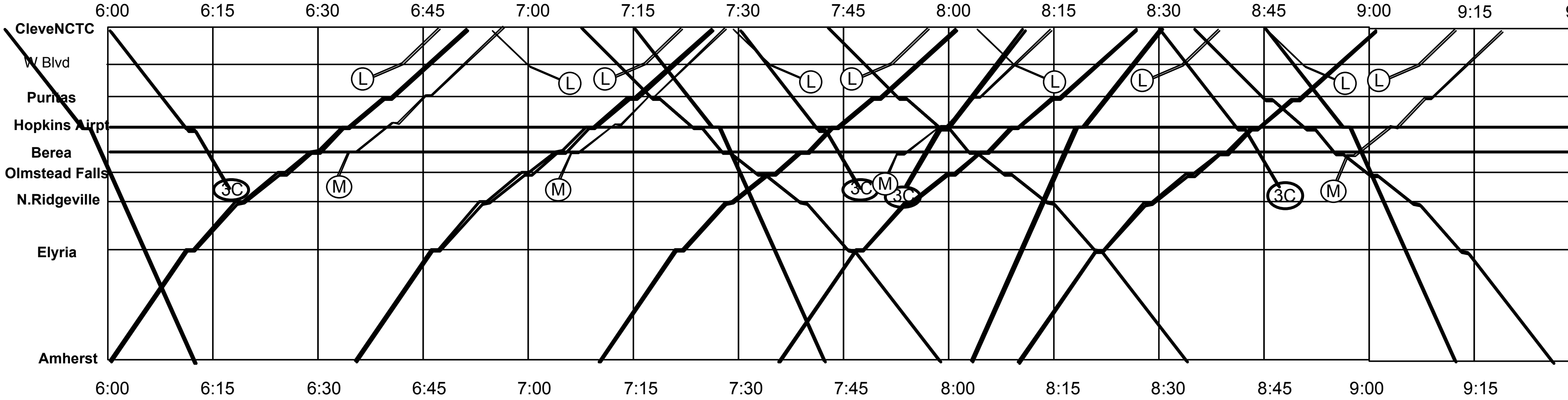
Uses **4** Train sets



Scenario 30 – Combined Routes West of Cleveland – Level of Service 3 – Weekday Morning Peak

Item - 30 **LOS-3** **Morning Schedule**

Cleveland - Amherst with Lorain, Medina, 3C, MWRRI, and Amtrak



Scenario 33 – Route 3 – Level of Service 2
Cleveland-Medina
Weekday Morning Peak

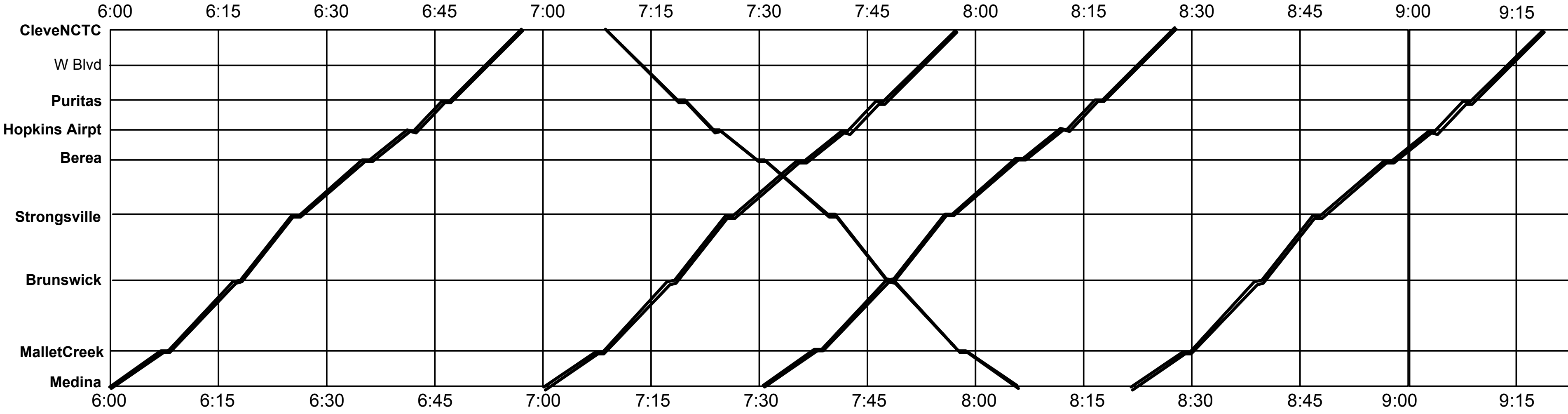
Item - 33

Morning Schedule

LOS - 2

Cleveland - Medina with 30-45 minute Headways PEAK PERIOD and 1 Reverse Peak Train

Uses **3** Train sets



Scenario 34 – Route 3 – Level of Service 3
Cleveland-Medina
Weekday Morning Peak

Item - 34

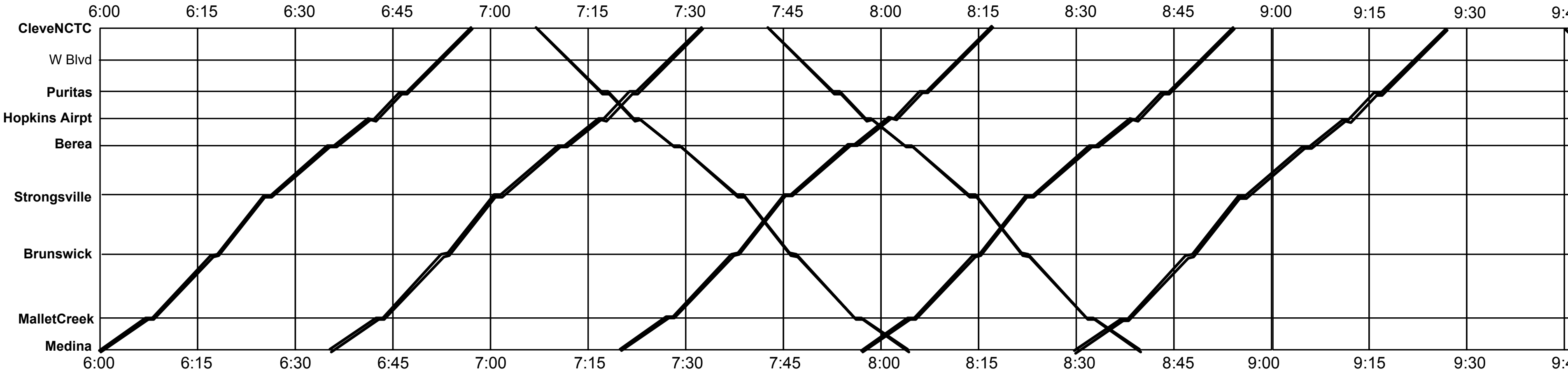
Morning Schedule

LOS - 3

Cleveland - Medina with 35 minute Headways PEAK PERIOD

3C

Uses **4** Train sets



Scenario 35 – Routes 1 + 6 – Level of Service 3
Lorain-Lakewood-Cleveland-Solon-Aurora
Weekday Morning Peak

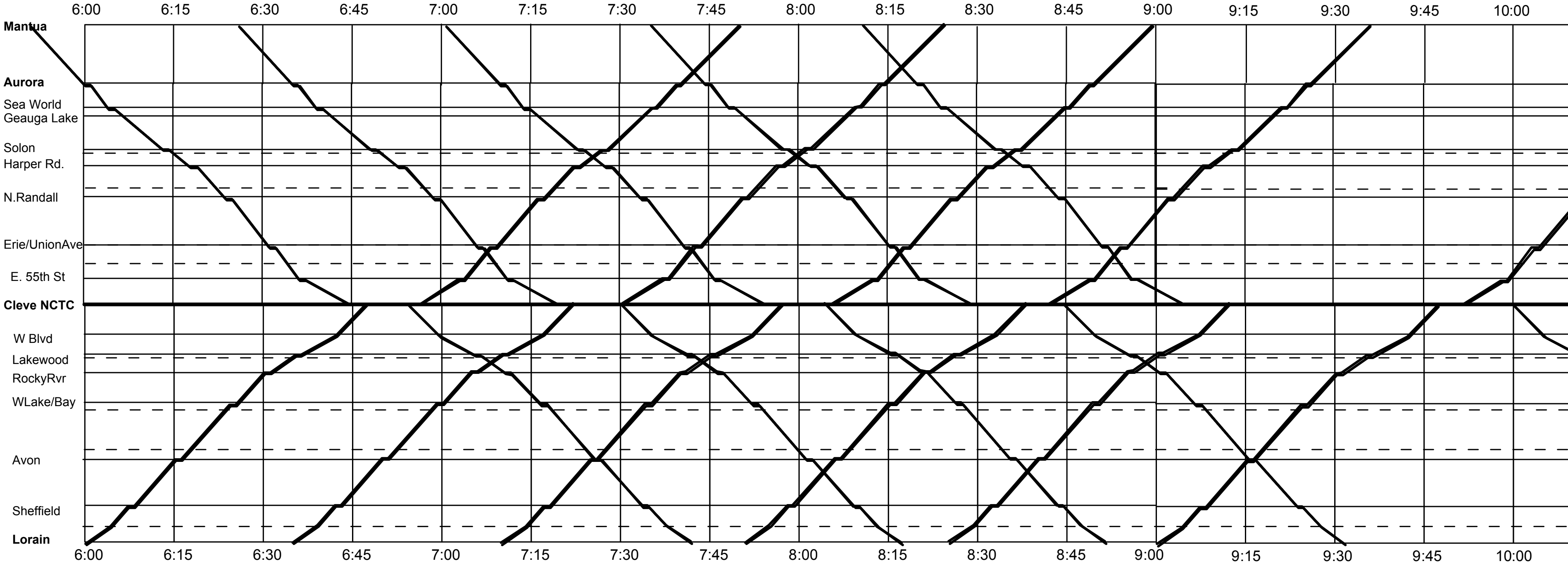
Item - 35

LOS 3+ **Morning Schedule**

3MantuaClev 35mHW

Mantua & Aurora - Cleveland with 35 minute Headways PEAK PERIOD

With 4 Train sets, the 35 minute interval could be maintained but an additional siding would be required at Aurora



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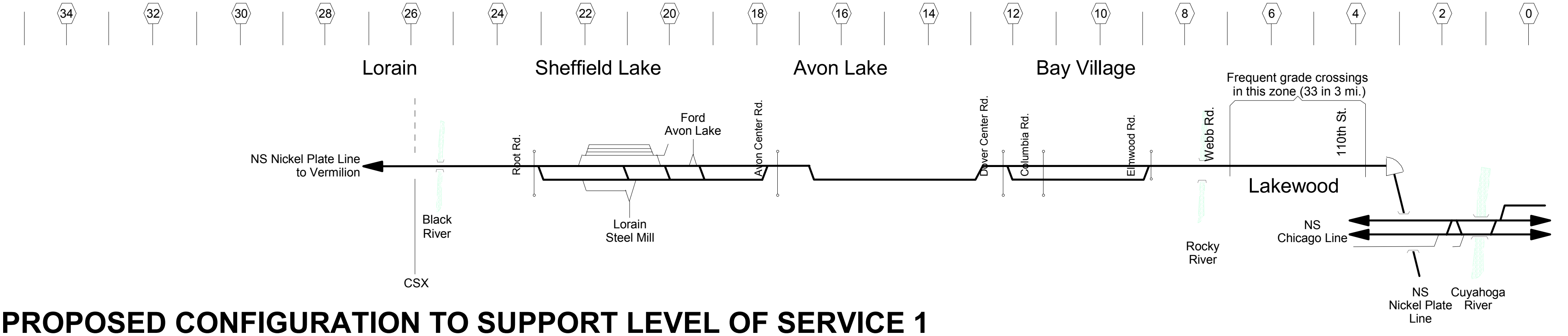
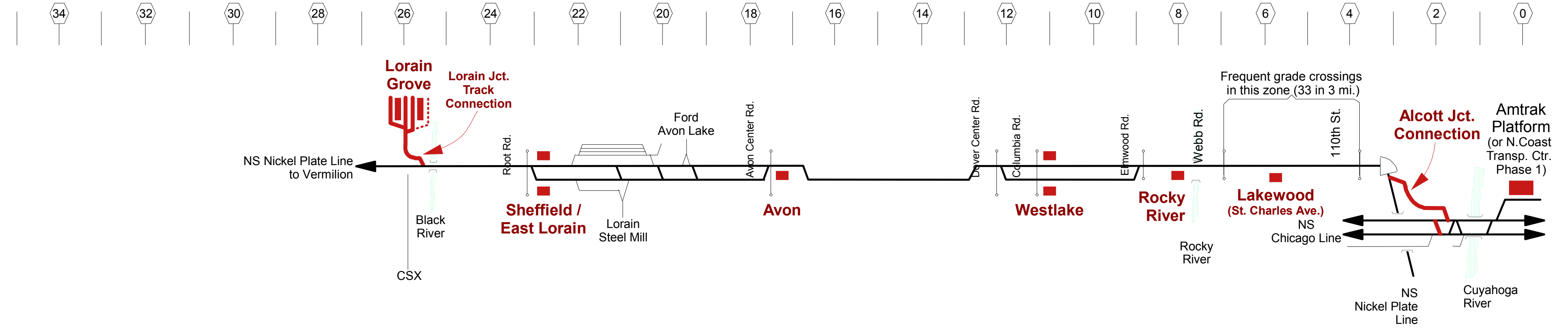
NEORAIL Phase II

ROUTE 1 ◦ LAKE WEST CORRIDOR ◦ CLEVELAND-LORAIN SERVICE

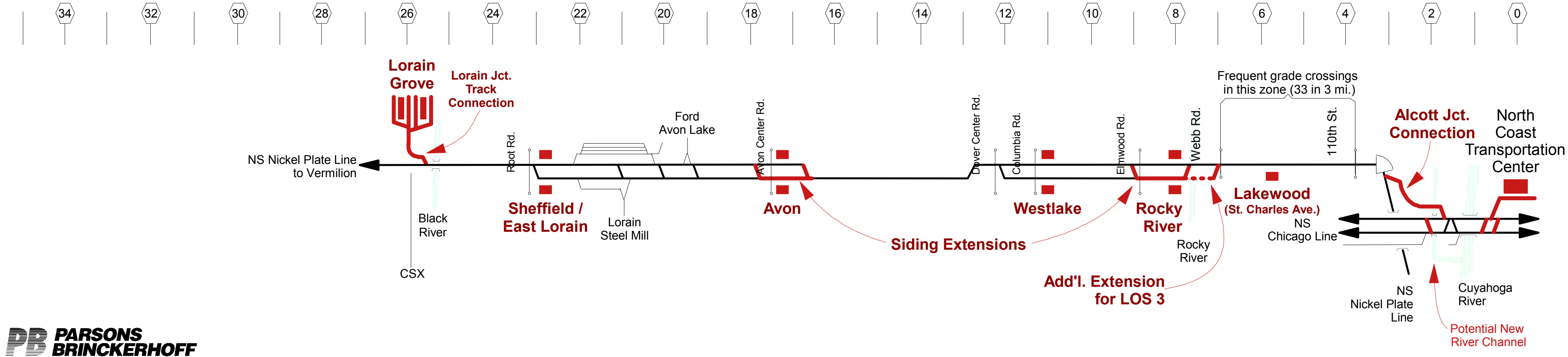
EXISTING RAILROAD CONFIGURATION



PROPOSED CONFIGURATION TO SUPPORT LEVEL OF SERVICE 1



PROPOSED CONFIGURATION TO SUPPORT LEVEL OF SERVICE 2



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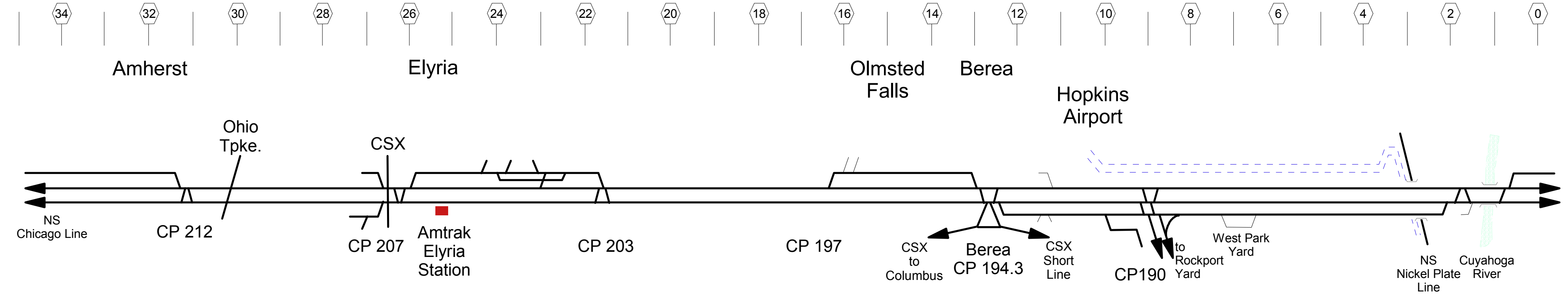
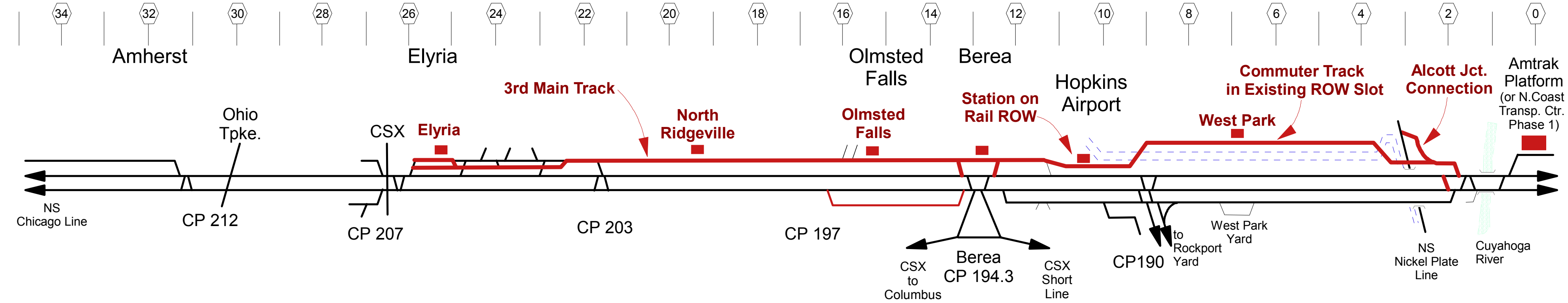
NEORAIL Phase II

ROUTE 2 ◦ WEST CORRIDOR ◦ CLEVELAND-ELYRIA-AMHERST SERVICE

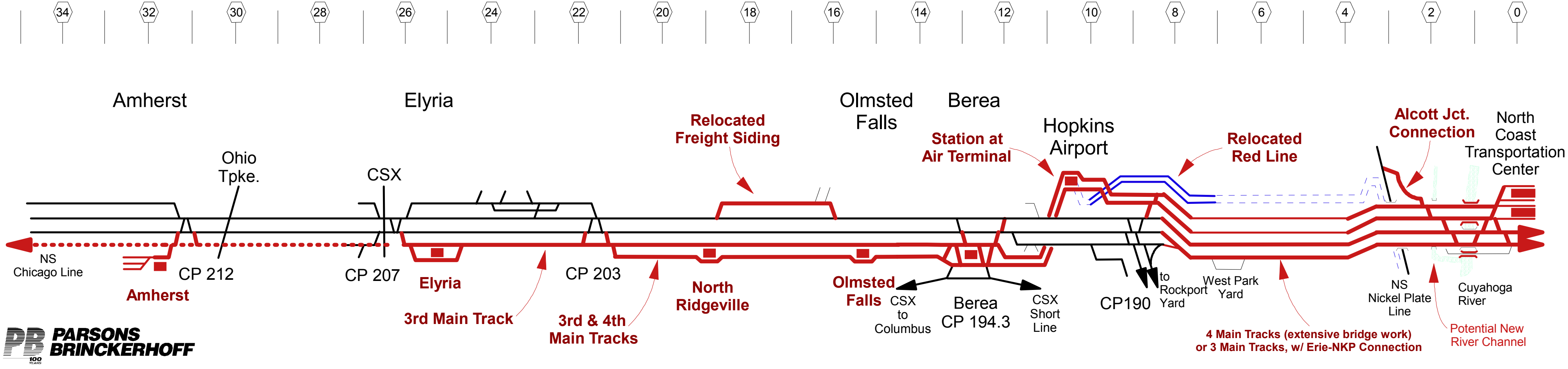
EXISTING RAILROAD CONFIGURATION



PROPOSED CONFIGURATION TO SUPPORT LEVEL OF SERVICE 1 or 2 (Commuter Rail Only)



PROPOSED CONFIGURATION TO SUPPORT LEVEL OF SERVICE 3 (with Midwest Regional Rail Service)



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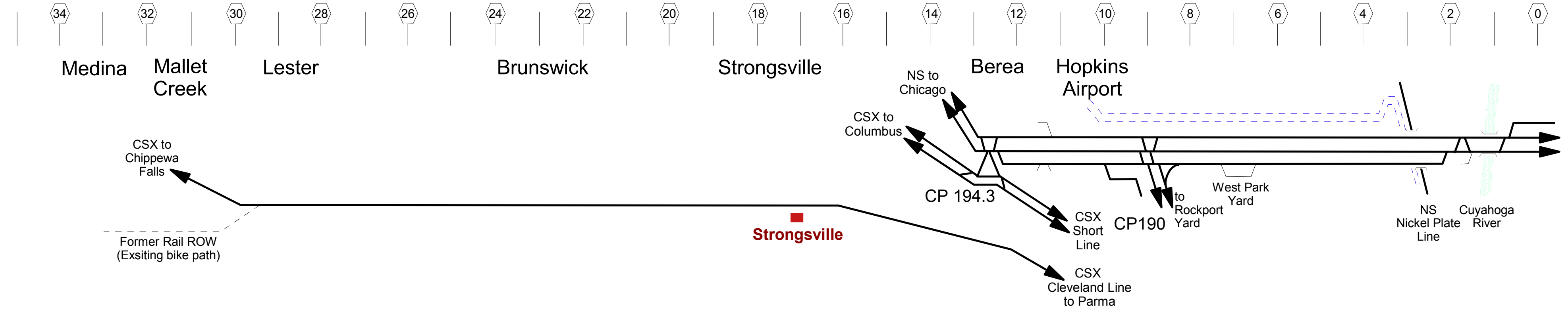
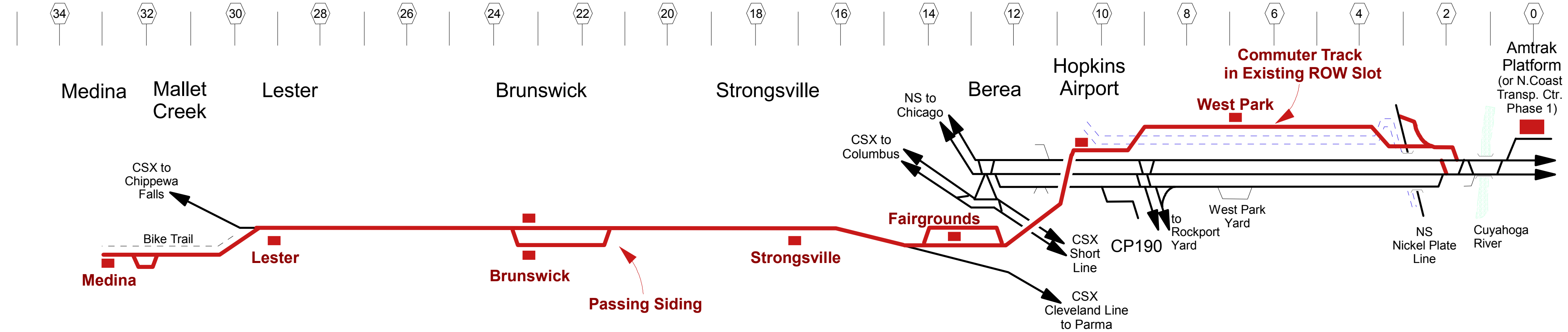
NEORAIL Phase II

ROUTE 3 ◦ SOUTHWEST CORRIDOR ◦ CLEVELAND-MEDINA SERVICE

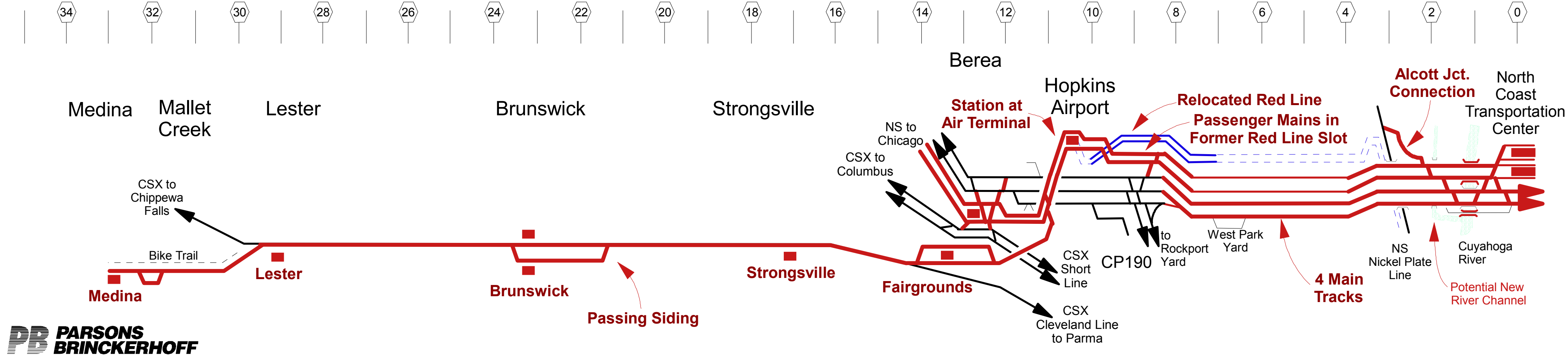
EXISTING RAILROAD CONFIGURATION



PROPOSED CONFIGURATION TO SUPPORT LEVEL OF SERVICE 1 OR 2



PROPOSED CONFIGURATION TO SUPPORT LEVEL OF SERVICE 3 (with Elyria Service)



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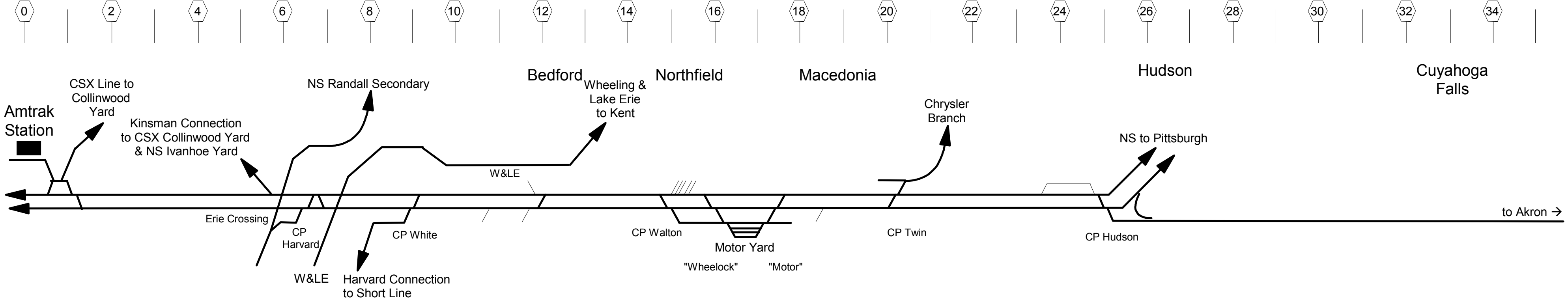
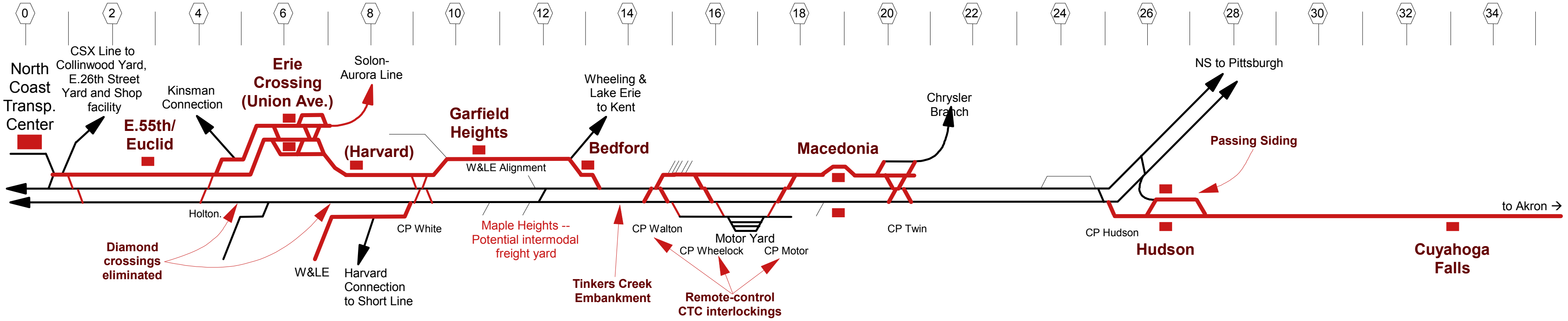
NEORAIL Phase II

ROUTE 4D ◦ SOUTH CORRIDOR ◦ CLEVELAND-AKRON-CANTON SERVICE

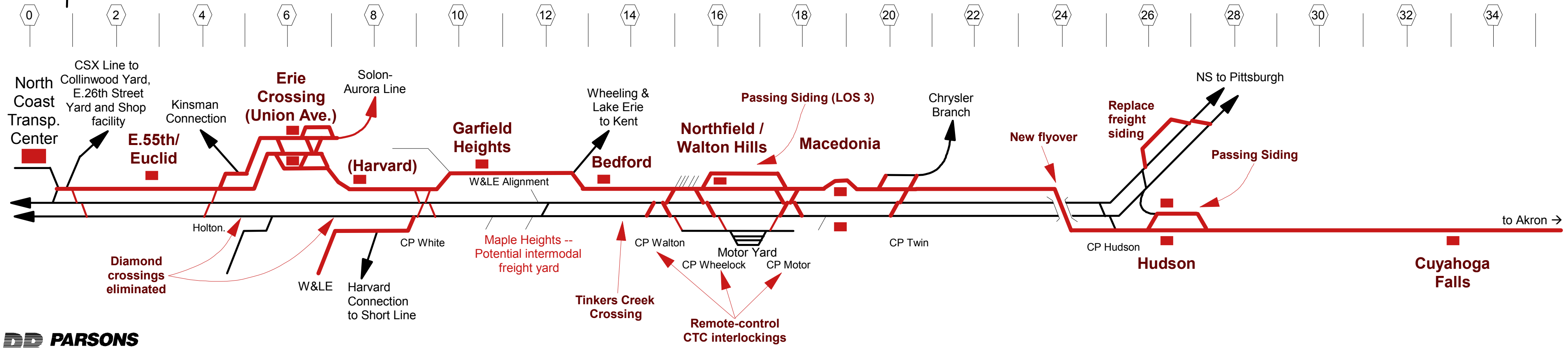
EXISTING RAILROAD CONFIGURATION



PROPOSED CONFIGURATION TO SUPPORT LEVEL OF SERVICE 1 OR 2



PROPOSED CONFIGURATION TO SUPPORT LEVEL OF SERVICE 2 OR 3



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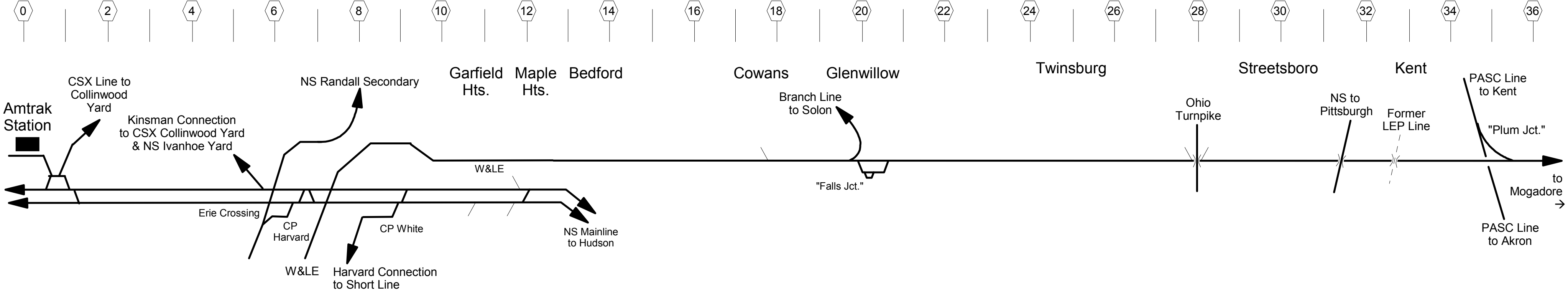
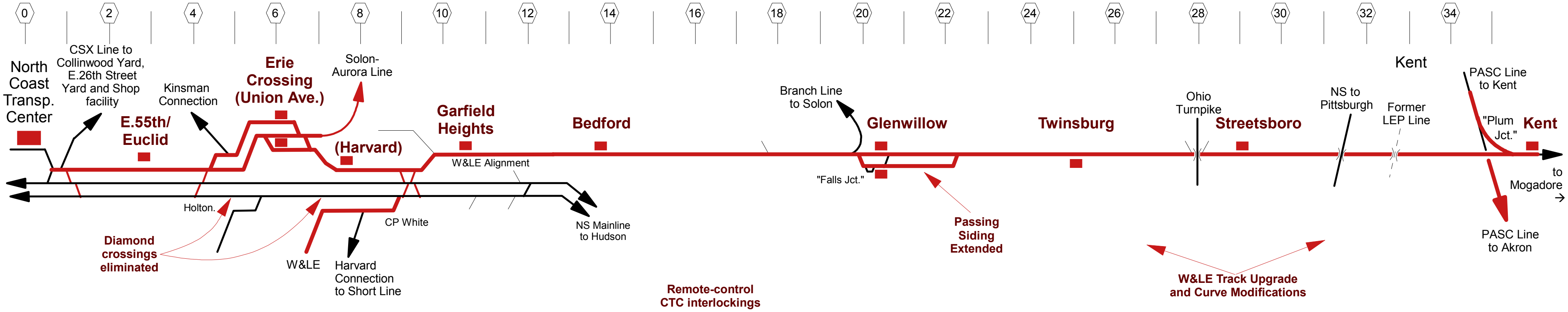
NEORAIL Phase II

ROUTE 4E ◦ SOUTH CORRIDOR ◦ CLEVELAND-KENT SERVICE

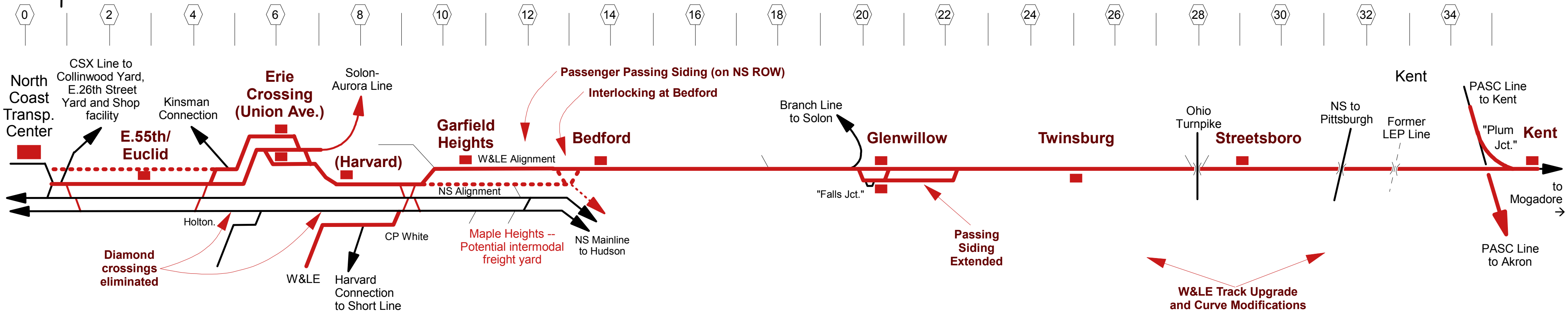
EXISTING RAILROAD CONFIGURATION



PROPOSED CONFIGURATION TO SUPPORT LEVEL OF SERVICE 1 AND 2



PROPOSED CONFIGURATION TO SUPPORT LEVEL OF SERVICE 3



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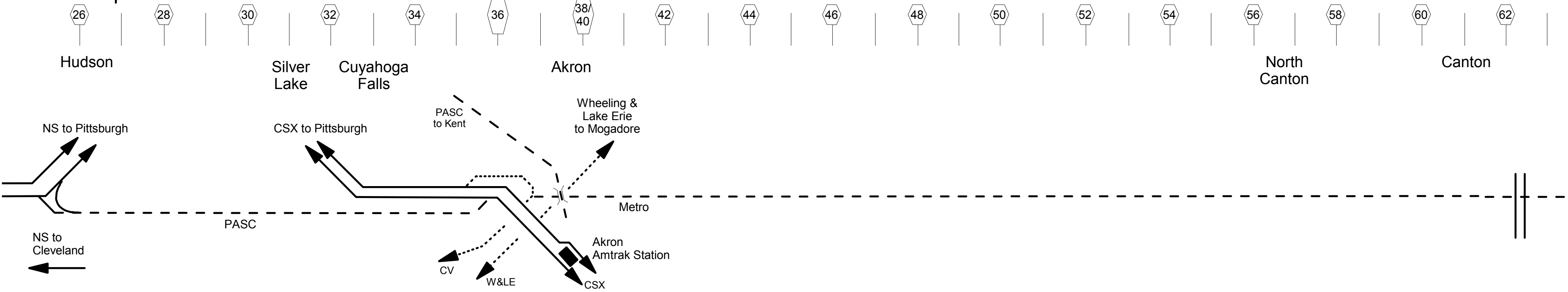
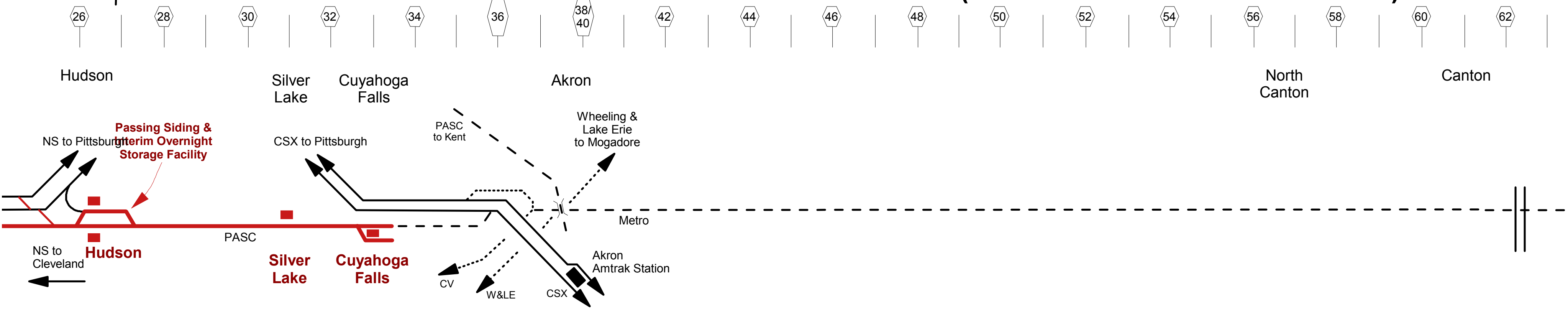
NEORAIL Phase II

ROUTE 4D/4E ◦ SOUTH CORRIDOR ◦ CLEVELAND-AKRON-CANTON SERVICE

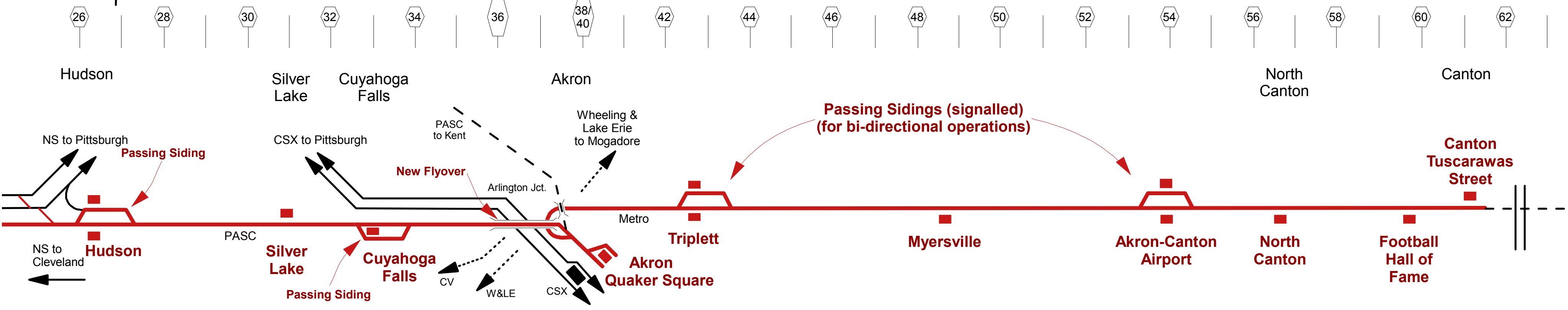
EXISTING RAILROAD CONFIGURATION



PROPOSED CONFIGURATION TO SUPPORT LEVEL OF SERVICE 1 (CUYAHOGA FALLS TERMINUS)



PROPOSED CONFIGURATION TO SUPPORT LEVEL OF SERVICE 2



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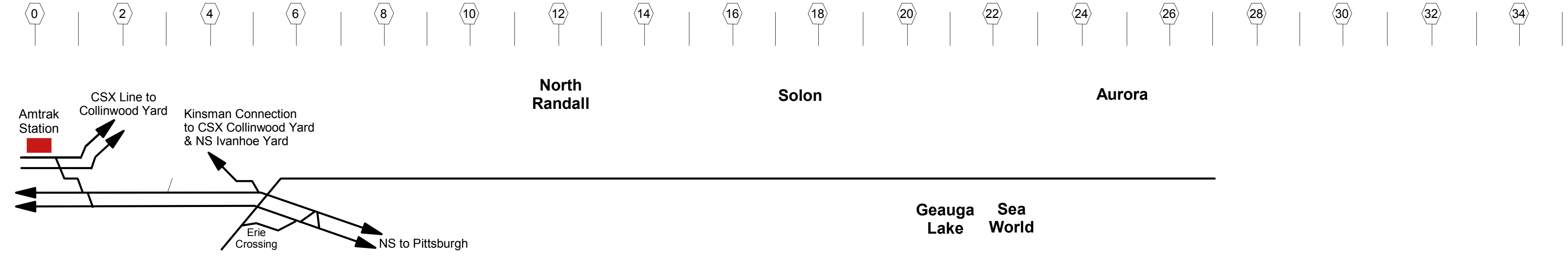
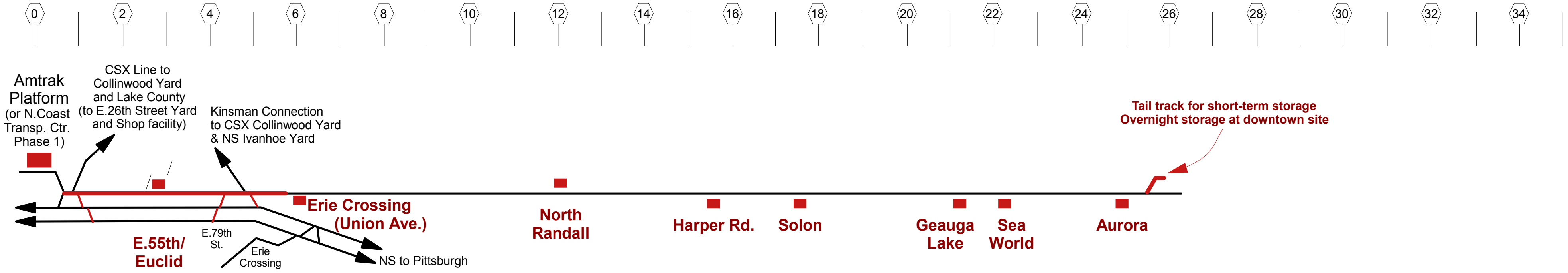
NEORAIL Phase II

ROUTE 6 ◦ EAST CORRIDOR ◦ CLEVELAND-AURORA SERVICE

EXISTING RAILROAD CONFIGURATION



PROPOSED CONFIGURATION TO SUPPORT LEVEL OF SERVICE 1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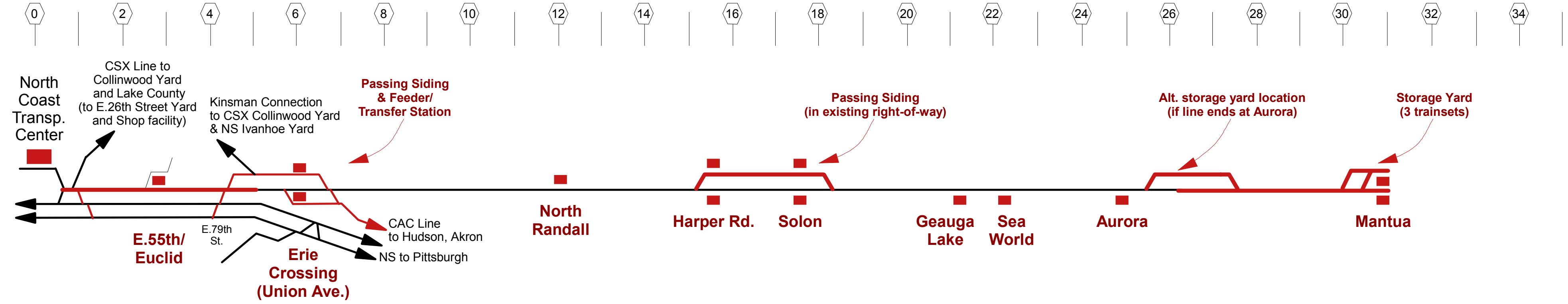
32
34
Amtrak Platform (or N.Coast Transp. Ctr. Phase 1)
CSX Line to Collinwood Yard and Lake County (to E.26th Street Yard and Shop facility)
Kinsman Connection to CSX Collinwood Yard & NS Ivanhoe Yard
Tail track for short-term storage
Overnight storage at downtown site
Erie Crossing (Union Ave.)
North Randall
Harper Rd.
Solon
Geauga Lake
Sea World
Aurora
E.55th/ Euclid
E.79th St.
Erie Crossing
NS to Pittsburgh

PROPOSED CONFIGURATION TO SUPPORT LEVEL OF SERVICE 2 OR 3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34
North Coast Transp. Center
CSX Line to Collinwood Yard and Lake County (to E.26th Street Yard and Shop facility)
Kinsman Connection to CSX Collinwood Yard & NS Ivanhoe Yard
Passing Siding & Feeder/ Transfer Station
Passing Siding (in existing right-of-way)
Alt. storage yard location (if line ends at Aurora)
Storage Yard (3 trainsets)
CAC Line to Hudson, Akron
NS to Pittsburgh
North Randall
Harper Rd.
Solon
Geauga Lake
Sea World
Aurora
Mantua
E.55th/ Euclid
E.79th St.
Erie Crossing (Union Ave.)

PARSONS BRINCKERHOFF

November 2000

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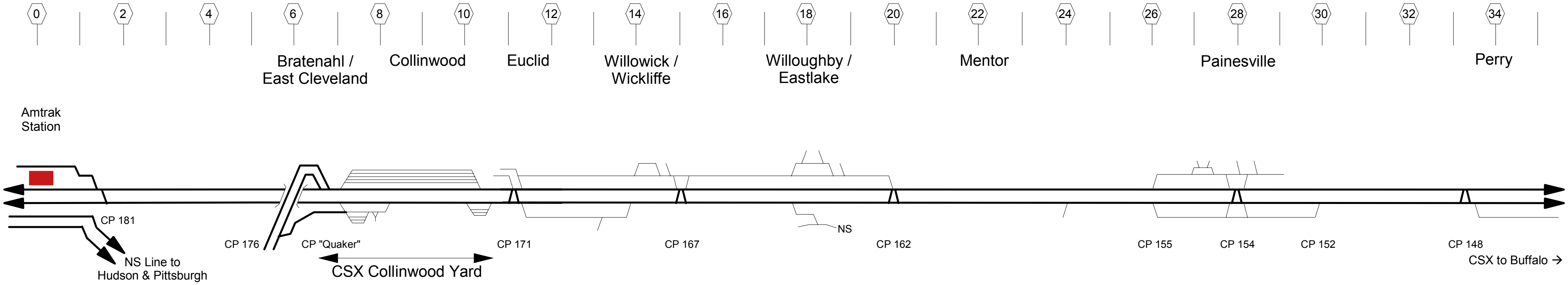
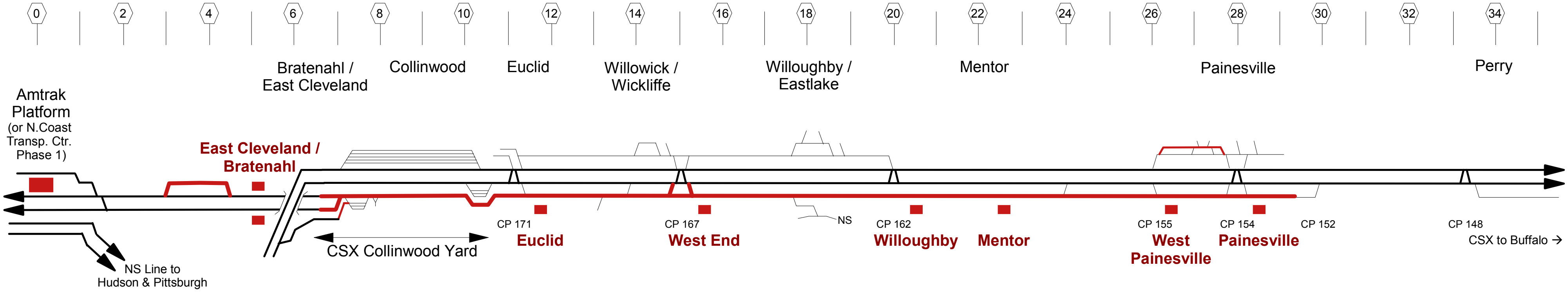
NEORAIL Phase II

ROUTE 7 ◦ LAKE EAST CORRIDOR ◦ CLEVELAND-PAINESVILLE

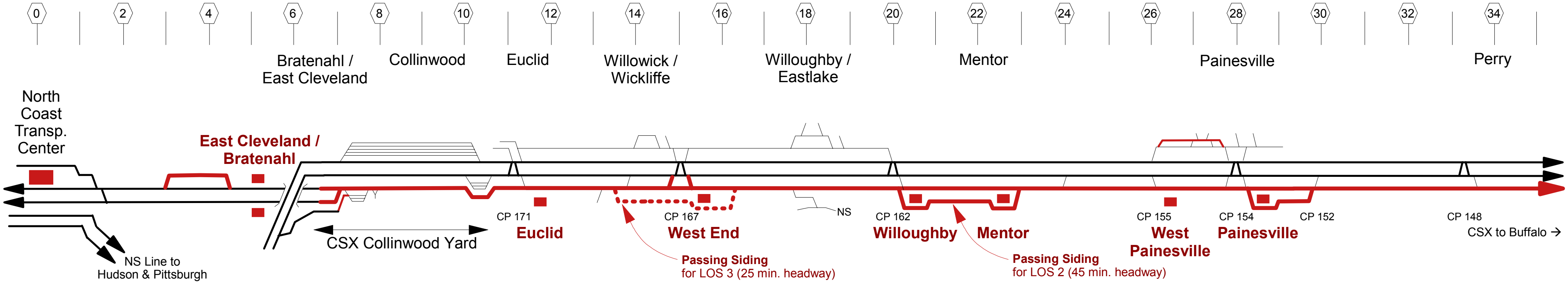
EXISTING RAILROAD CONFIGURATION



PROPOSED CONFIGURATION TO SUPPORT LEVEL OF SERVICE 1



PROPOSED CONFIGURATION TO SUPPORT LEVEL OF SERVICE 2 OR 3



PB PARSONS BRINCKERHOFF

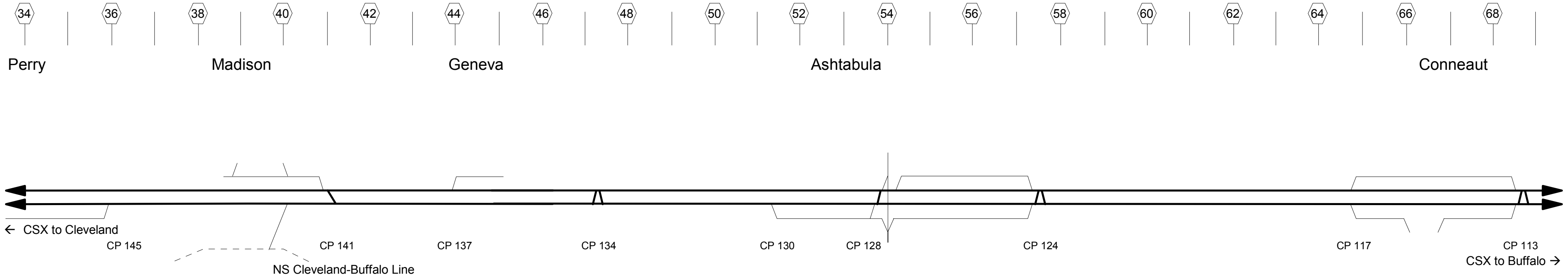
November 2000

Preliminary -- For Discussion Purposes Only

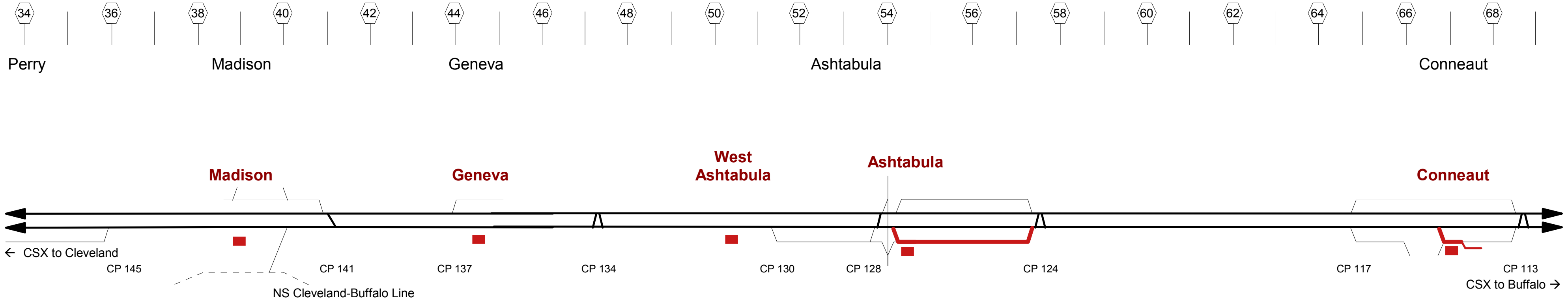
NEORAIL Phase II

ROUTE 7 ◦ LAKE EAST CORRIDOR ◦ PAINESVILLE-CONNEAUT

EXISTING RAILROAD CONFIGURATION



PROPOSED CONFIGURATION TO SUPPORT LEVEL OF SERVICE 1



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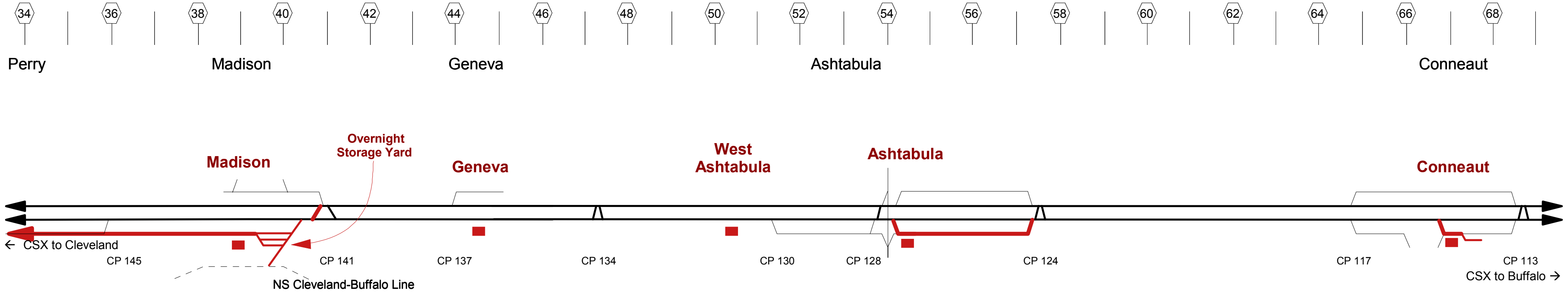

PARSONS BRINCKERHOFF

November 2000
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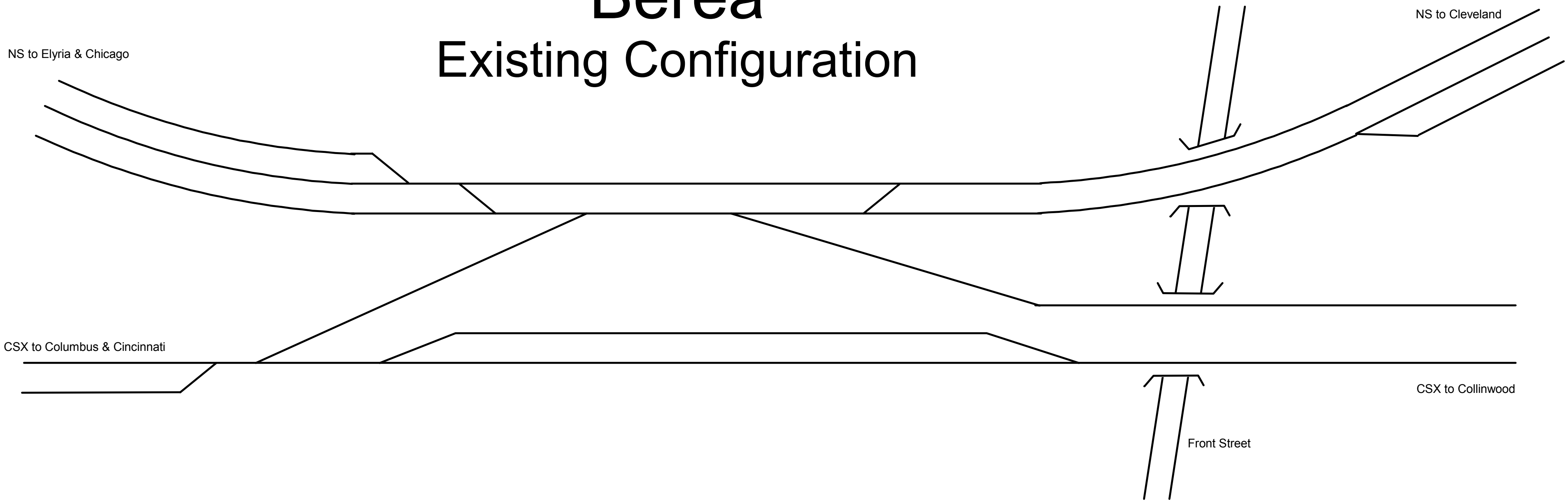
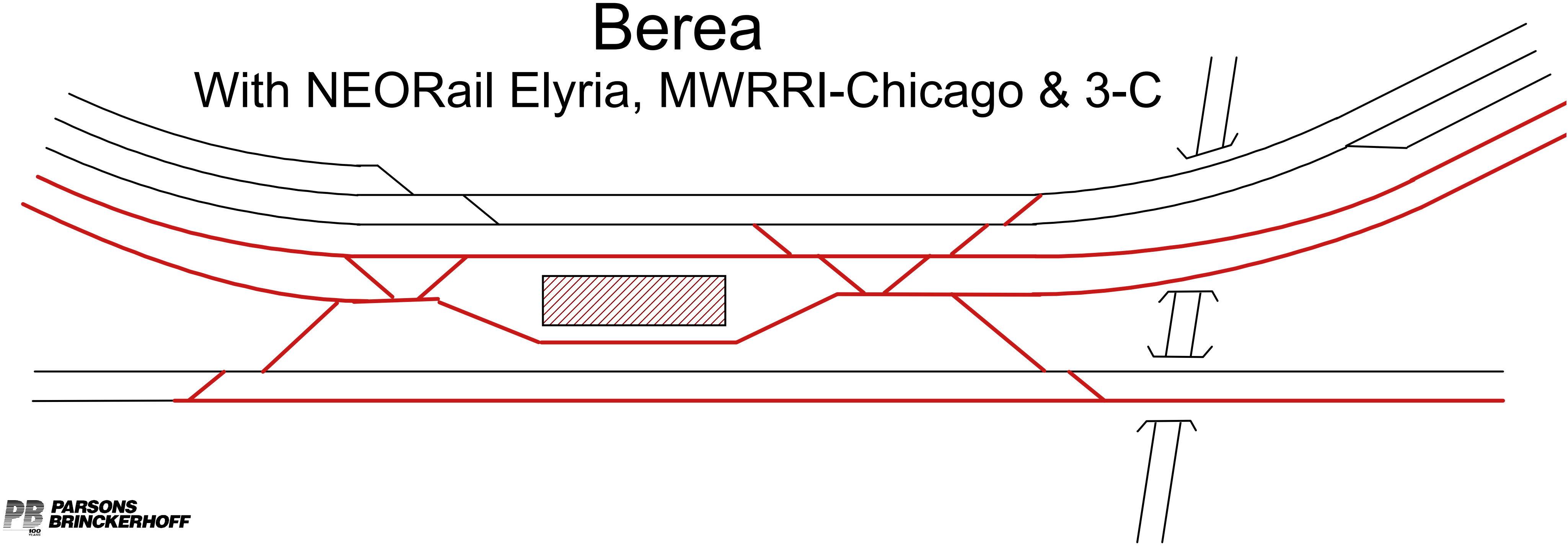
NEORAIL Phase II
ROUTE 2

Berea
Existing Configuration



Berea
With NEORail Elyria, MWRRI-Chicago & 3-C



PARSONS BRINCKERHOFF

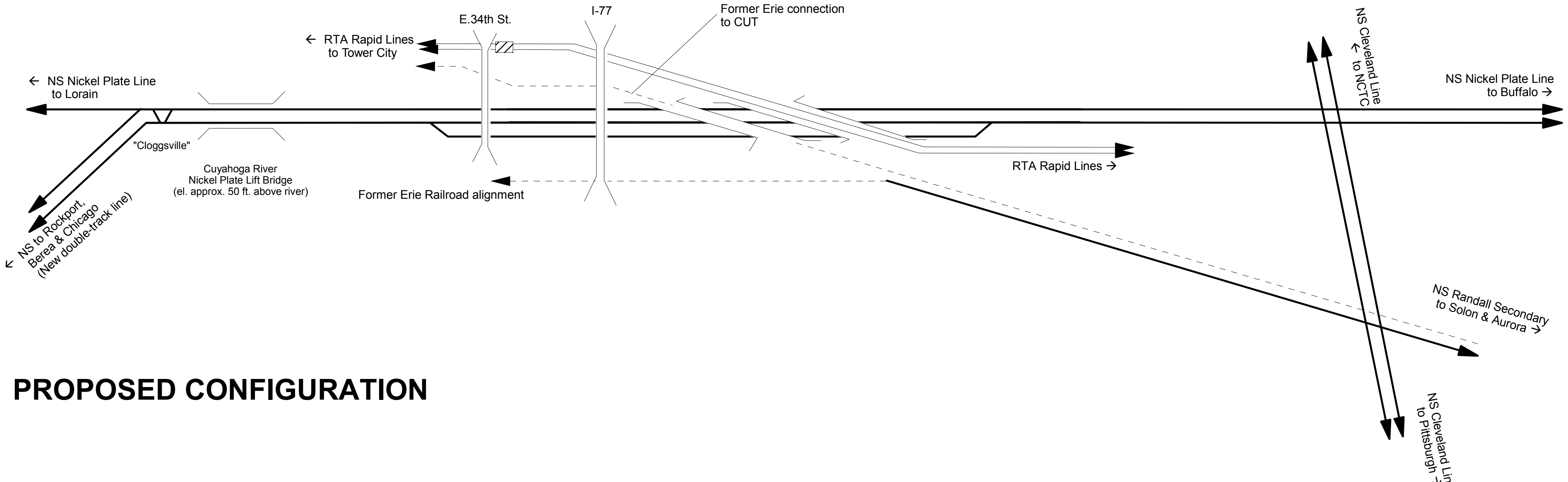
November 2000

Preliminary -- For Discussion Purposes Only

NEORAIL Phase II

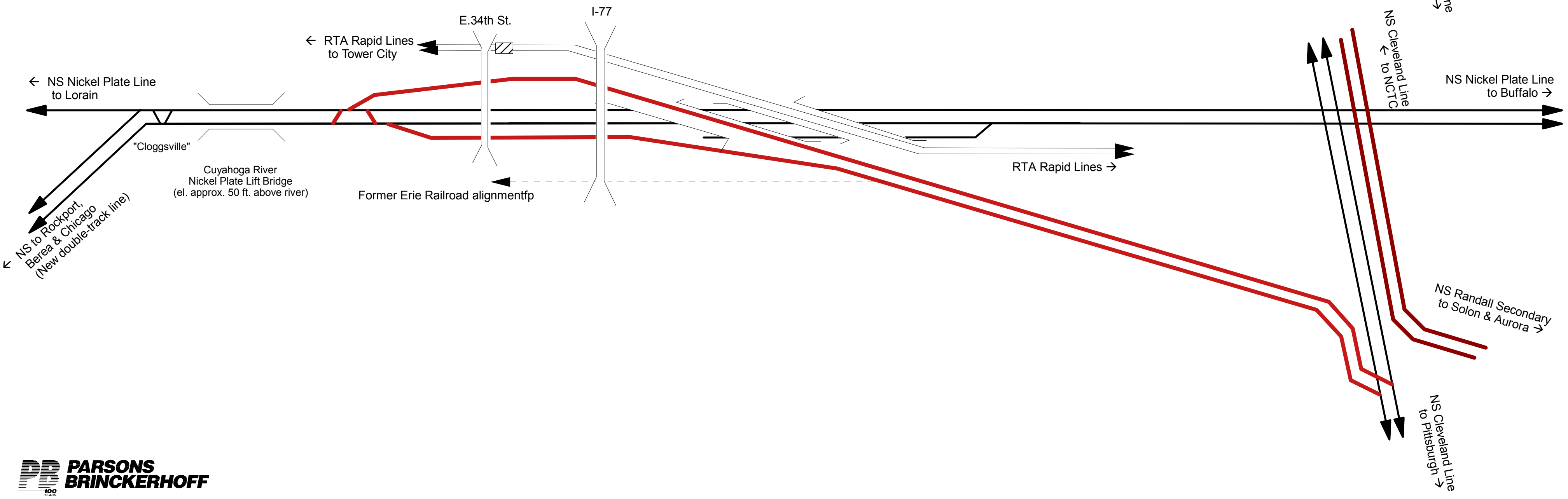
ERIE - NICKEL PLATE CONNECTION

EXISTING RAILROAD CONFIGURATION



E.34th St.
I-77
Former Erie connection to CUT
← RTA Rapid Lines to Tower City
NS Cleveland Line ← to NCTC
← NS Nickel Plate Line to Lorain
NS Nickel Plate Line to Buffalo →
"Cloggsville"
Cuyahoga River Nickel Plate Lift Bridge (el. approx. 50 ft. above river)
RTA Rapid Lines →
Former Erie Railroad alignment
← NS to Rockport, Berea & Chicago (New double-track line)
NS Randall Secondary to Solon & Aurora →
NS Cleveland Line to Pittsburgh →

PROPOSED CONFIGURATION



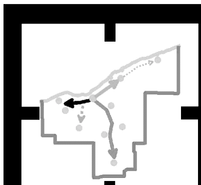
E.34th St.
I-77
← RTA Rapid Lines to Tower City
NS Cleveland Line ← to NCTC
← NS Nickel Plate Line to Lorain
NS Nickel Plate Line to Buffalo →
"Cloggsville"
Cuyahoga River Nickel Plate Lift Bridge (el. approx. 50 ft. above river)
RTA Rapid Lines →
Former Erie Railroad alignmentfp
← NS to Rockport, Berea & Chicago (New double-track line)
NS Randall Secondary to Solon & Aurora →
NS Cleveland Line to Pittsburgh →

PARSONS BRINCKERHOFF

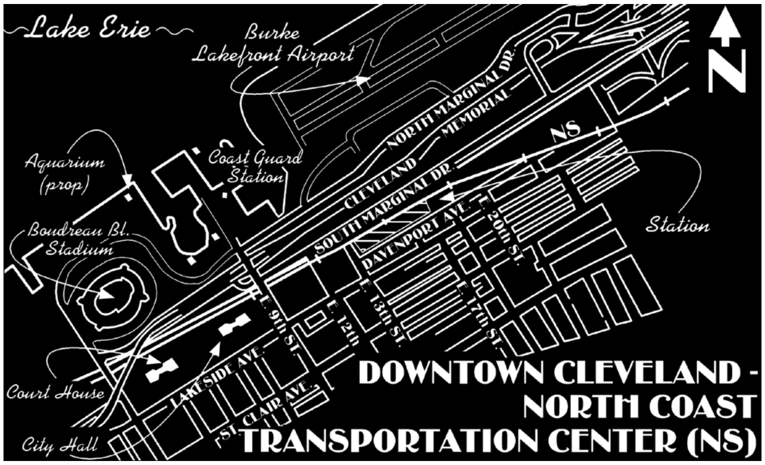
Appendix J:

Station Locations

Early & Mid-Term Projects



Cleveland
NORTH COAST TRANSPORTATION CENTER



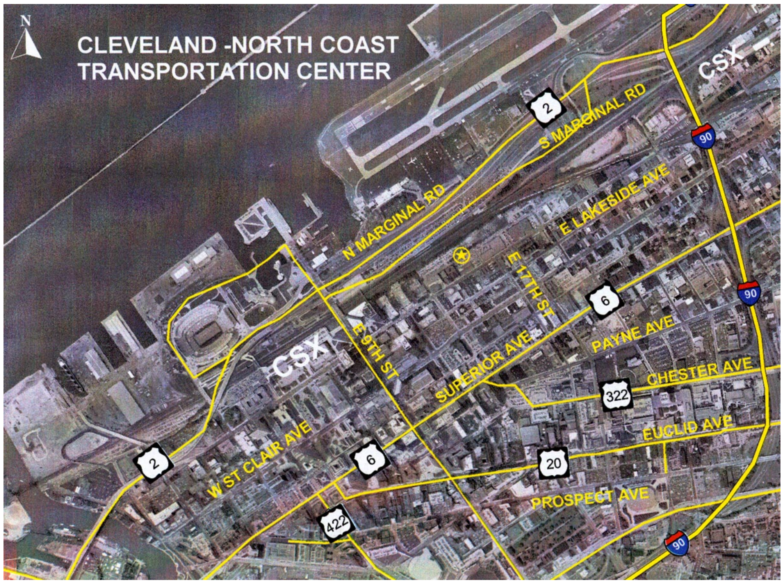
DOWNTOWN CLEVELAND - NORTH COAST TRANSPORTATION CENTER (NS)

STATION DESCRIPTIONS

- Downtown Cleveland station for all NEORail routes
- Station Type: Major intermodal transportation center
- Site: SR 2/Marginal Rd./E. 9th/W. 3rd
- Serves: Cleveland Central Business District
- Current Land Use: Existing Amtrak station, light rail line & freight tracks
- Railroad: CSX Transportation & NS Chicago Line
- Configuration: Full build-out includes 3 island platforms (six tracks)
- Highway access: SR 2, I-90

CONSTRAINTS/OPPORTUNITIES

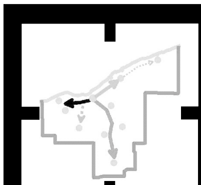
- Located on edge of Central Business District
- Within 1/2 mile of more dowtown jobs than Tower City
- Transfer connections to Waterfront Line & downtown Loop buses
- Convenient pedestrian connections to downtown & lakefront
- Potential joint development (e.g. convention center)



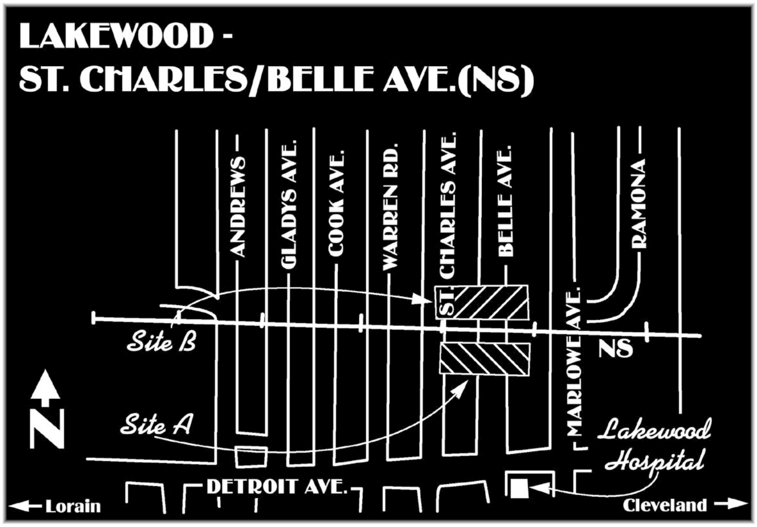
STATION RATINGS

Access	◑
Parking	○
Cost	○
Market (Origin)	○
Market (Destination)	◑
Implementation	◑

Scale: ○ lowest (worst) ● highest (best)



Lakewood
ST. CHARLES/BELLE AVE.

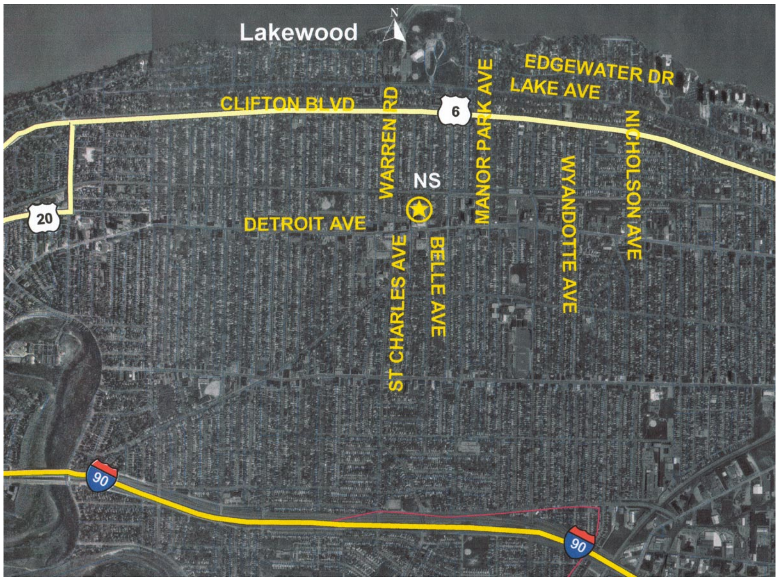


STATION DESCRIPTIONS

- **Route 1: Lake West Corridor**
- **Station Type: Town Center, limited park-and-ride**
- **Serves: Lakewood, Western Cleveland**
- **Current Land Use: Passive open space**
- **Railroad: NS Nickel Plate Line**
- **Configuration: Side platform, south side of tracks**
- **Highway access: I-90, SR 2, US 6/20**

CONSTRAINTS/OPPORTUNITIES

- **Nearby parking garage: add covered walkway**
- **Two suitable platform locations**
- **Train may block one or two grade crossings for about a minute while stopped**

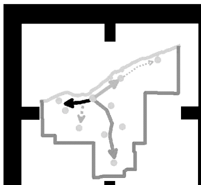


STATION RATINGS

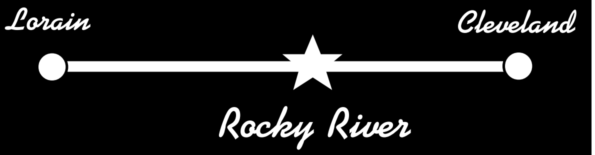
➢	**Access**	◑
➢	**Parking**	●
➢	**Cost**	◑
➢	**Market (Origin)**	◑
➢	**Market (Destination)**	○
➢	**Implementation**	◑

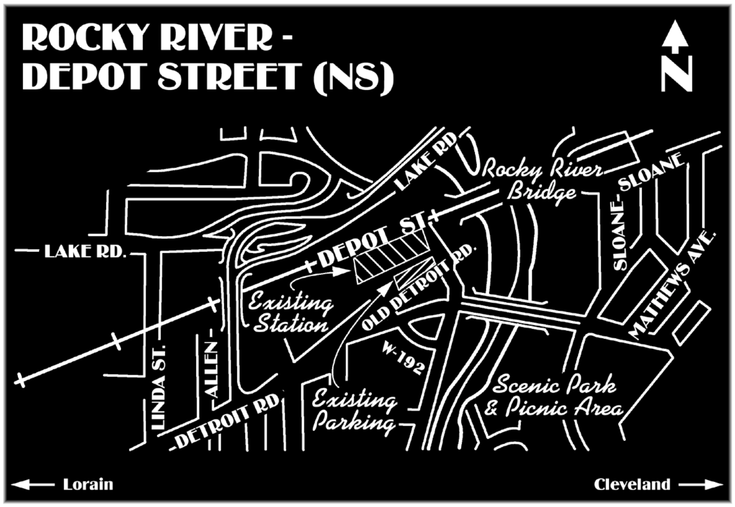
Scale: ○ lowest (worst) ● highest (best)

PB 100 YEARS
SCATS
AMATS
NOACA Planning For Greater Cleveland



Rocky River
DEPOT STREET



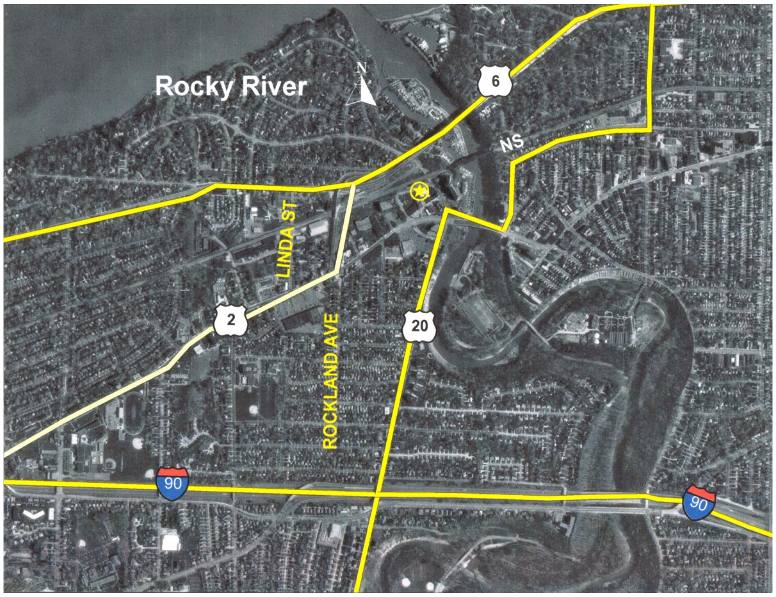


STATION DESCRIPTIONS

- **Route 1: Lake West Corridor**
- **Station Type: Town Center, limited park-and-ride**
- **Site: Depot Street, Rocky River**
- **Serves: Rocky River, Fairview Park**
- **Current Land Use: Existing parking lot and station building**
- **Railroad: NS Nickel Plate Line**
- **Configuration: Two side platforms, second track extended through station**
- **Highway access: I-90, SR 2, US 6/20**

CONSTRAINTS/OPPORTUNITIES

- **Former station site**
- **Existing parking lot**
- **Need good signage, pedestrian facilities**

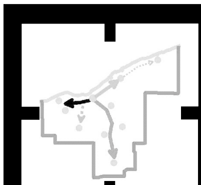


STATION RATINGS

Access	◑
Parking	◑
Cost	◑
Market (Origin)	◑
Market (Destination)	○
Implementation	◑

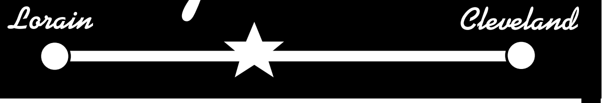
Scale: ○ lowest (worst) ● highest (best)

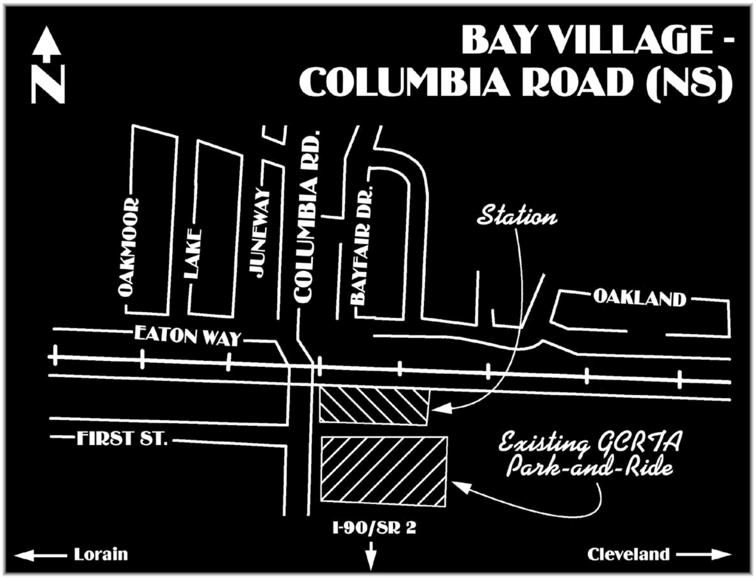
PB 100 YEARS
SCATS
AMATS
NOACA Planning For Greater Cleveland



Westlake/Bay Village

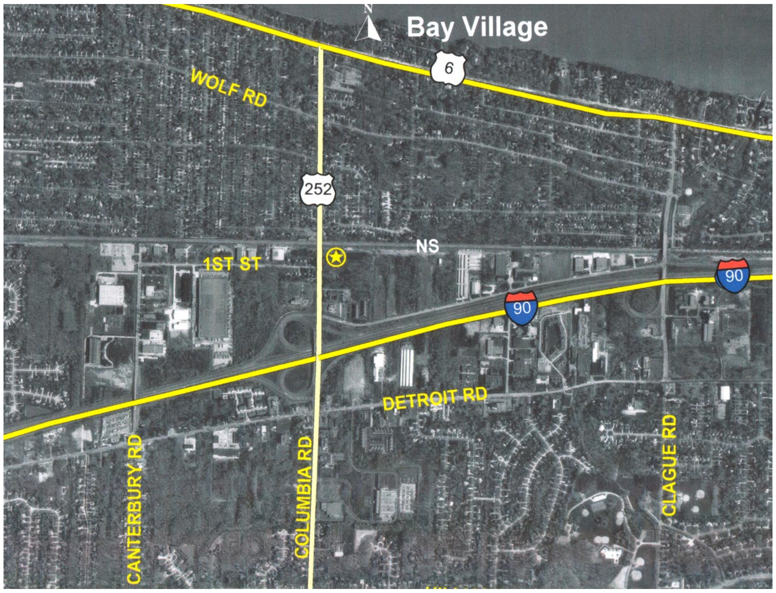
COLUMBIA ROAD





CONSTRAINTS/OPPORTUNITIES

- Existing and well-used park-and-ride lot
- One-quarter mile from I-90
- Nearby multi-family housing



STATION DESCRIPTIONS

- Route 1: Lake West Corridor
- Station Type: Park-and-ride
- Site: Columbia Road, Westlake
- Serves: Westlake, Bay Village, North Olmsted
- Current Land Use: Existing park-and -ride lot
- Railroad: NS Nickel Plate Line
- Configuration: Two side platforms
- Highway access: I-90, SR 2, US 6/20

STATION RATINGS

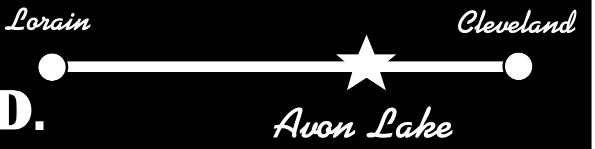
Access	●
Parking	●
Cost	◑
Market (Origin)	●
Market (Destination)	○
Implementation	●

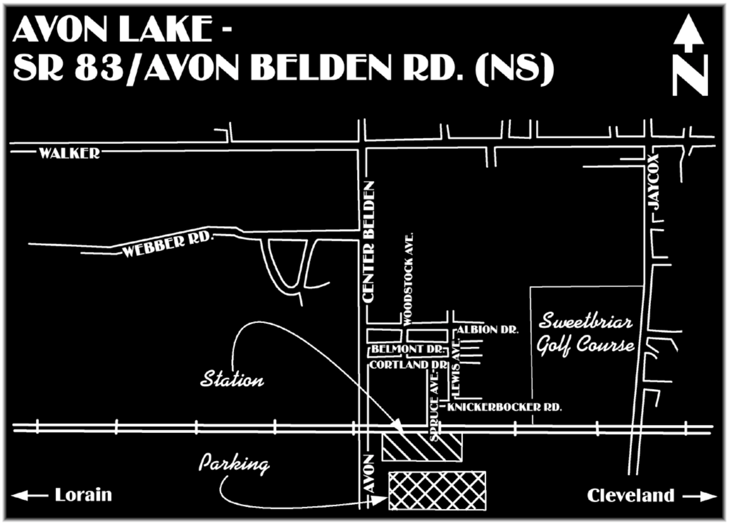
Scale: ○ lowest (worst) ● highest (best)

SCATS AMATS NOACA Planning For Greater Cleveland

Avon Lake

SR 83/AVON BELDEN RD.



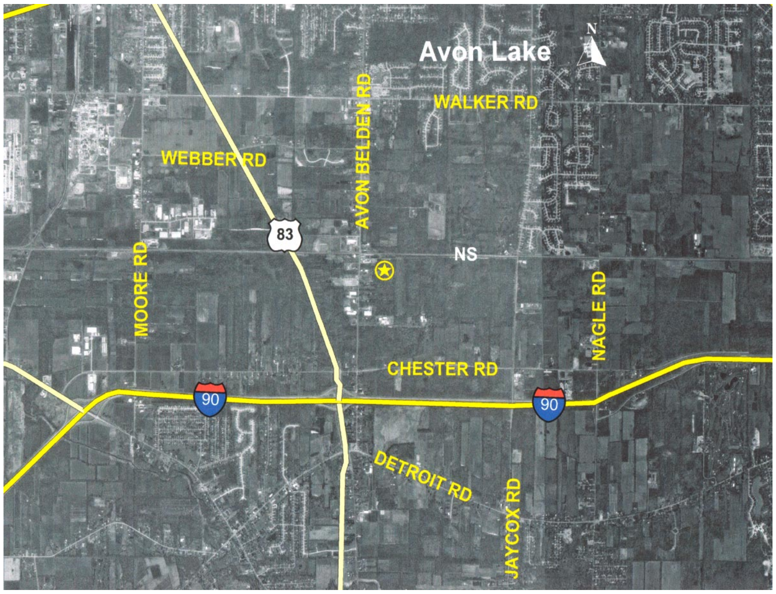


STATION DESCRIPTIONS

- Route 1: Lake West Corridor
- Station Type: Park-and-ride
- Site: SR 83 - Avon Belden Road
- Serves: Avon, Avon Lake, N. Ridgeville, Elyria
- Current Land Use: Vacant
- Railroad: NS Nickel Plate Line
- Configuration: Two side platforms, second track extended through station
- Highway access: I-90, SR 2, SR 83

CONSTRAINTS/OPPORTUNITIES

- Available land for parking
- Good highway access
- Potential joint of station area development



STATION RATINGS

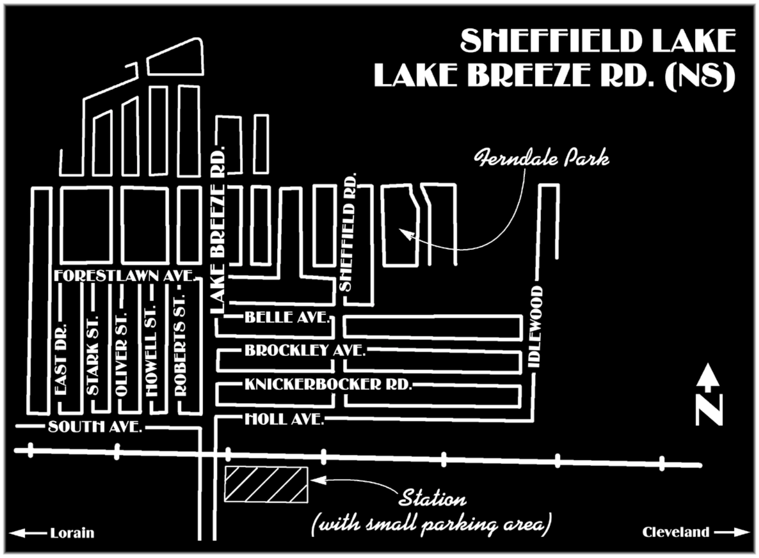
Access	●
Parking	●
Cost	◑
Market (Origin)	●
Market (Destination)	○
Implementation	◑

Scale: ○ lowest (worst) ● highest (best)

Sheffield Lake
LAKE BREEZE RD.

Lorain — ★ — Cleveland

Sheffield Lake

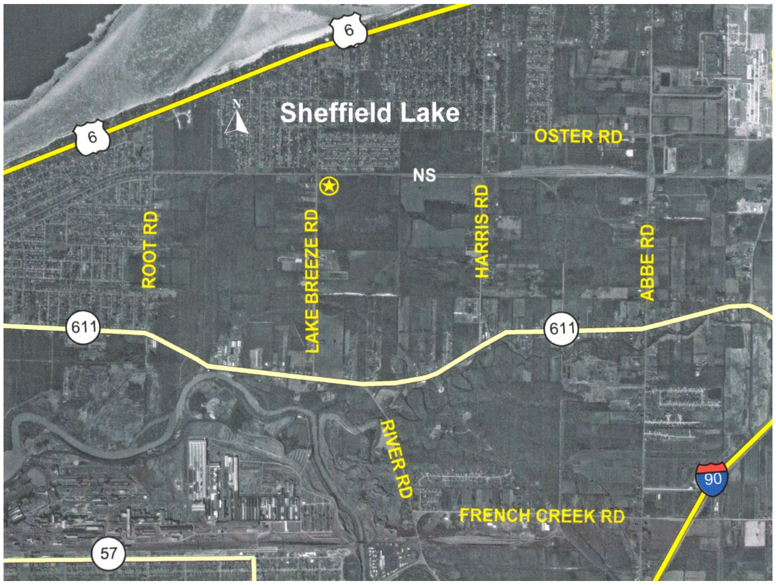


STATION DESCRIPTIONS

- **Route 1: Lake West Corridor**
- **Station Type: Park-and-ride**
- **Site: Columbia Road, Westlake**
- **Serves: Sheffield, Sheffield Lake, East Lorain**
- **Current Land Use: Vacant, wooded**
- **Railroad: NS Nickel Plate Line**
- **Configuration: Two side platforms**
- **Highway access: I-90, SR 2, SR 611, US 6**

CONSTRAINTS/OPPORTUNITIES

- **Small park-and-ride opportunity**
- **Good access to Sheffield Lake Community**



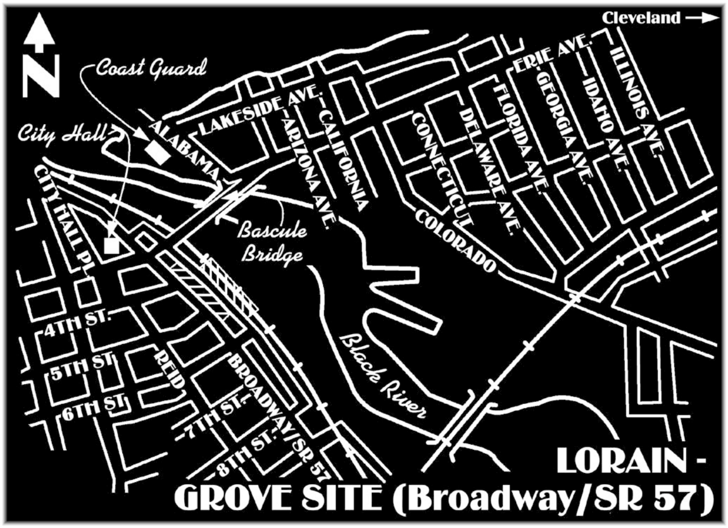
STATION RATINGS

➢	**Access**	◑
➢	**Parking**	○
➢	**Cost**	◑
➢	**Market (Origin)**	◑
➢	**Market (Destination)**	○
➢	**Implementation**	◑

Scale: ○ **lowest (worst)** ● **highest (best)**

Lorain
Grove Site

Lorain — Cleveland

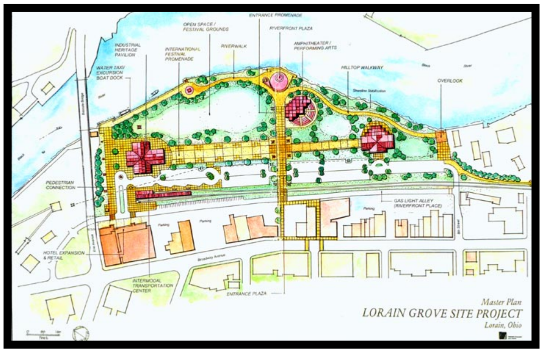


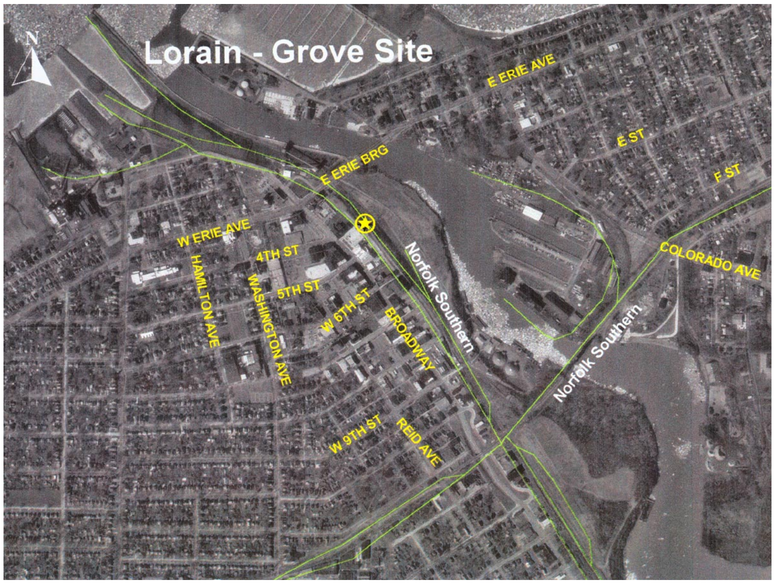
STATION DESCRIPTIONS

- **Route 1: Lake West Corridor**
- **Station Type: Town Center, park-and-ride**
- **Site: US 6 & Broadway, downtown Lorain**
- **Serves: Lorain**
- **Current Land Use: Vacant, former rail yard**
- **Railroad: Former CSX line**
- **Configuration: Terminal station, with two-track island platform**
- **Highway access: US 6, SR 57**

CONSTRAINTS/OPPORTUNITIES

- **Adjacent to Lorain central business district**
- **Part of Lorain City master plan**
- **Excellent joint development potential**
- **Sufficient land for paring available**
- **End-of-line station requires train storage yard**
- **Location away from mainline railroad reduces impact on freight operations**





STATION RATINGS

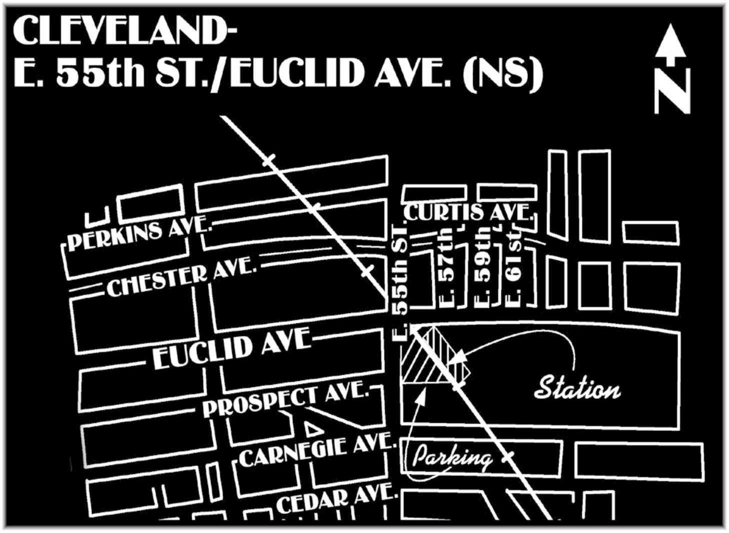
Access	◐
Parking	●*
Cost	●*
Market (Origin)	◐
Market (Destination)	◐
Implementation	●*

* As part of new development

Scale: ○ lowest (worst) ● highest (best)

Cleveland

E. 55TH & EUCLID AVE.

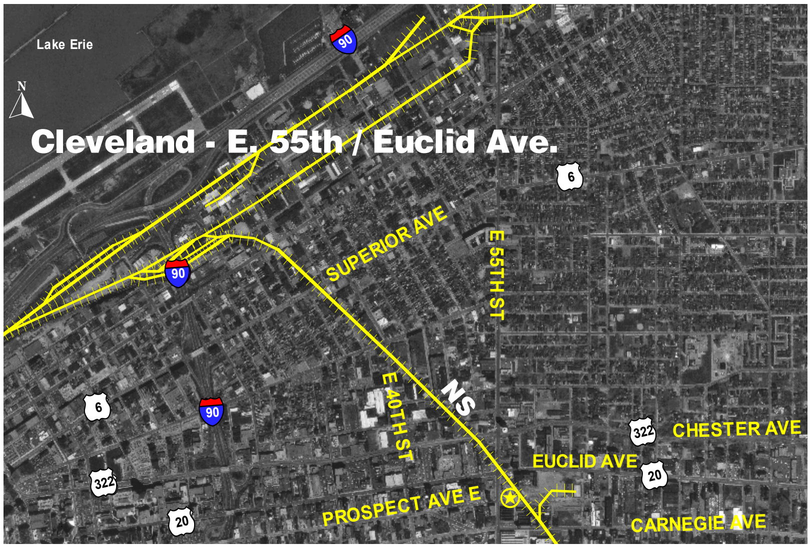


STATION DESCRIPTIONS

- Route 6 – Southeast Corridor, Routes 4 & 5 – South Corridor
- Station Type: Urban, major transfer station
- Site: E. 55th St. & Euclid Ave., Cleveland
- Serves: City of Cleveland east side, University Circle (via bus transfer)
- Current Land Use: Parking lot, former rail station site
- Railroad: NS Cleveland Line
- Configuration: Island platform on raised embankment, with stair and elevator access to street
- Highway access: E. 55th St. Euclid Ave.

CONSTRAINTS/OPPORTUNITIES

- Ability to create convenient transfer connections with Euclid Ave. buses
- Uses existing pedestrian underpass
- Joint development potential
- Constrained platform space
- Industrial track must be preserved through east side of site

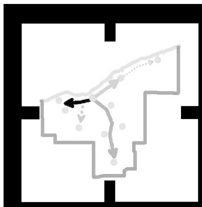


STATION RATINGS

(relative to alternative locations)

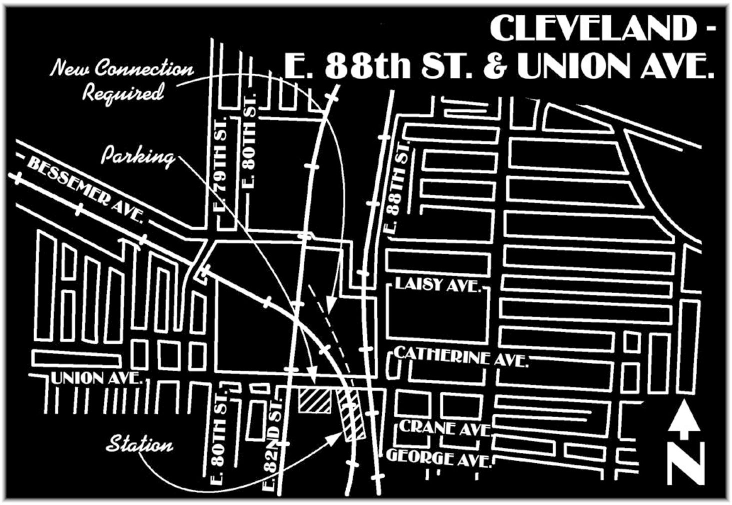
Access	●
Parking	●
Cost	◐
Market (Origin)	●
Market (Destination)	○
Implementation	◐

Scale: ○lowest (worst) ●highest (best)



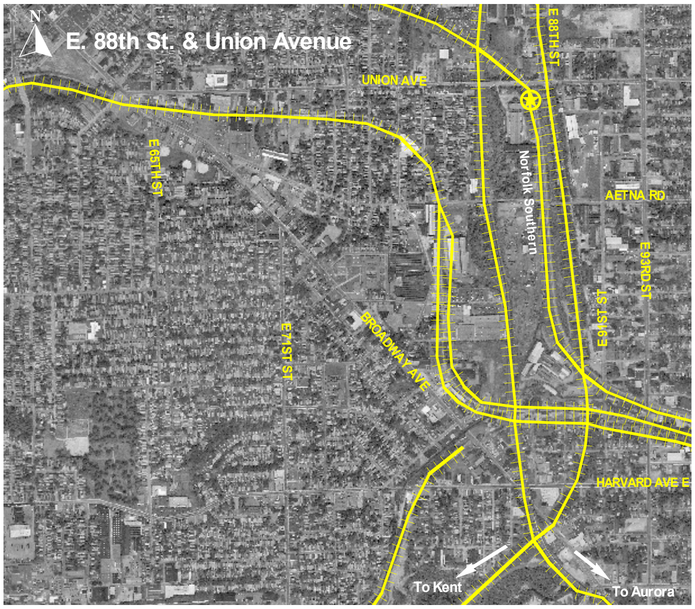
Cleveland

EAST 88TH/UNION



CONSTRAINTS/OPPORTUNITIES

- Transfer to and from local and circulator GCRTA bus routes
- Potential transfers between NEORail routes
- Available land for parking lot and station
- Direct access from Union Ave. at traffic signal
- Joint development potential
- Requires good signage and improved pedestrian facilities



STATION DESCRIPTIONS

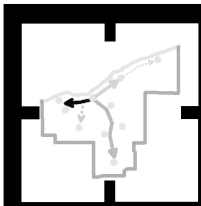
- Route 6 - Southeast Corridor
  Routes 4 & 5 - South Corridor
- Station Type: Urban, major transfer station
- Site: Union Ave. bridge across rail right-of-way, Cleveland
- Serves: City of Cleveland east side, Newburgh Hts., Cuyahoga Hts.
- Current Land Use: Vacant
- Railroad: NS Randall Secondary
- Configuration: Full build-out includes three tracks, with one island and one side platform
- Highway access: Union Ave., SR 14/ Broadway, Harvard Ave.

STATION RATINGS

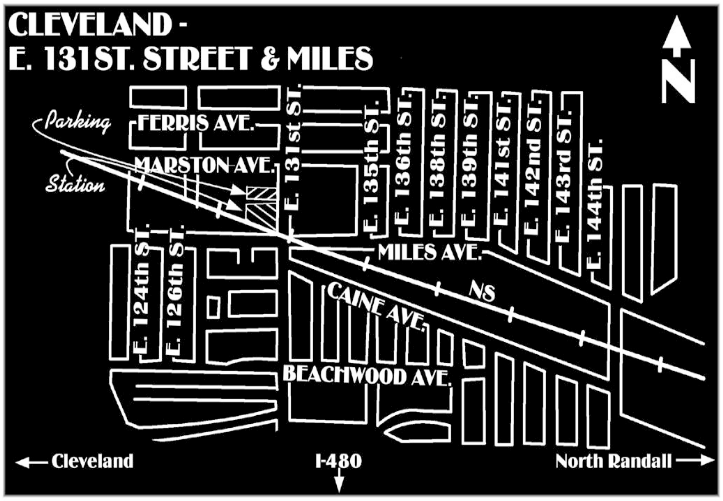
(relative to alternative locations)

Access	◑
Parking	○
Cost	○
Market (Origin)	◑
Market (Destination)	○
Implementation	◑

Scale: ○lowest (worst) ●highest (best)



Cleveland
E. 131ST. & MILES

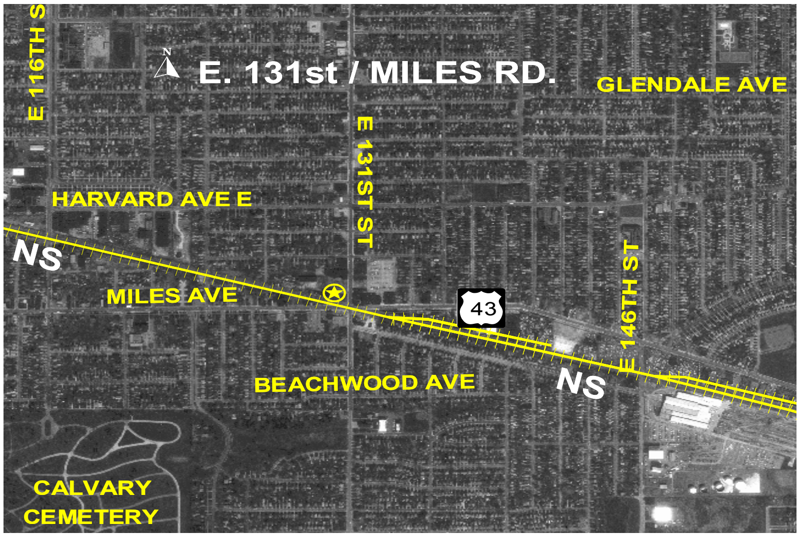


STATION DESCRIPTIONS

- Route 6 – Southeast Corridor
- Station Type: Urban, bus transfer station
- Site: Adjacent to intersection of Miles Ave. and E. 131st St.
- Serves: City of Cleveland east side, East Cleveland
- Current Land Use: Mixed residential, commercial, industrial in station area
- Railroad: NS Randall Secondary
- Configuration: Side platform, north side of tracks
- Highway access: I-480, Miles Ave., E. 131st St.

CONSTRAINTS/OPPORTUNITIES

- Transfer to and from local GCRTA bus routes
- Very limited park-and-ride potential
- Situated close to multi-family residential
- Special grade crossing protection required for Miles/E. 131st intersection (skewed angles)

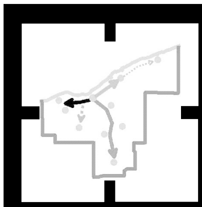


STATION RATINGS
(relative to alternative locations)

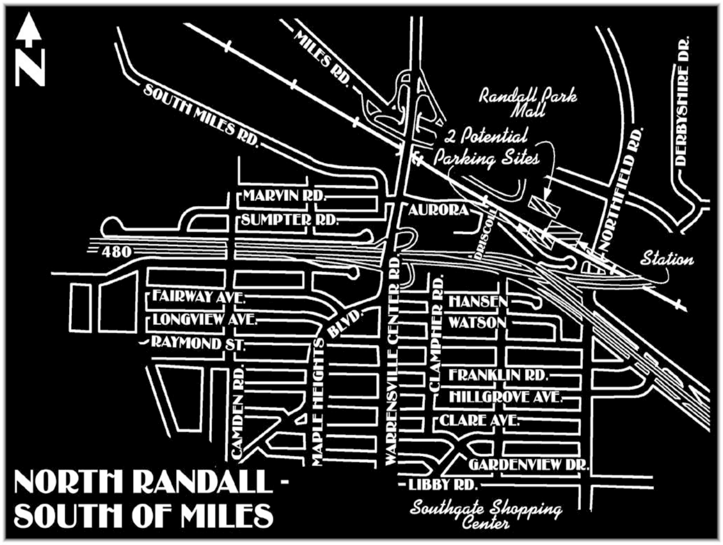
Access	◑
Parking	○
Cost	●
Market (Origin)	◑
Market (Destination)	○
Implementation	◑

Scale: ○lowest (worst) ●highest (best)

Northeast Ohio Commuter Rail Feasibility Study Phase II



North Randall/ Bedford Heights
AURORA ROAD

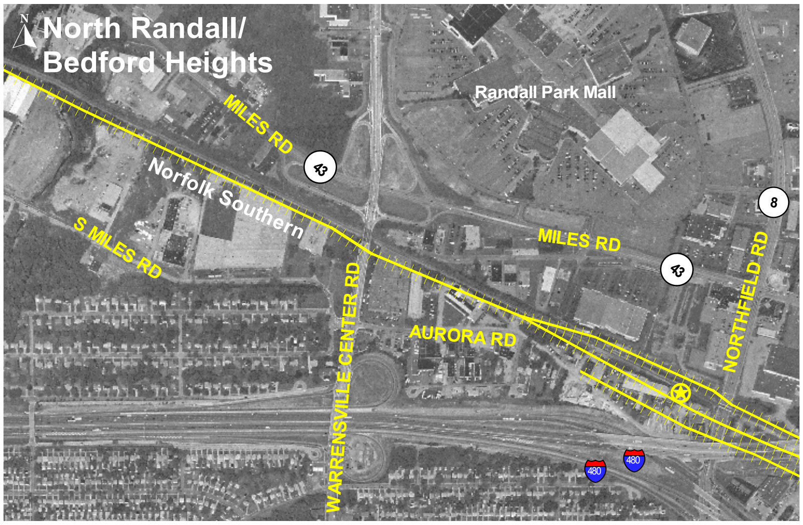


STATION DESCRIPTIONS

- Route 6 - Southeast Corridor
- Station Type: Park-and-ride
- Site: Aurora Rd. or Miles Rd., between Warrensville Center and Northfield Roads, North Randall
- Serves: North Randall, Bedford Hts., Warrensville Hts., Randall Park Mall, Thistle Down Racetrack
- Current Land Use: Vacant, parking lots, industrial/commercial
- Railroad: NS Randall Secondary
- Configuration: Side platform, north or south side of tracks
- Highway access: I-480, SR 8-Northfield Rd., Warrensville Ctr. Rd.

CONSTRAINTS/OPPORTUNITIES

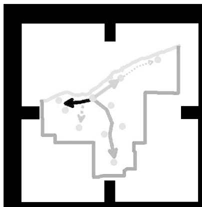
- Transfer to and from local GCRTA bus routes
- Sufficient available land for park-and-ride, via Aurora Rd.
- Situated close to residential areas, shopping mall, racetrack
- Joint development potential



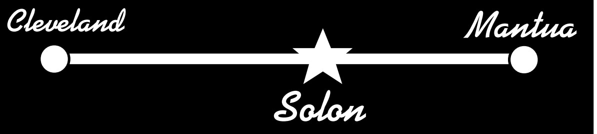
STATION RATINGS
(relative to alternative locations)

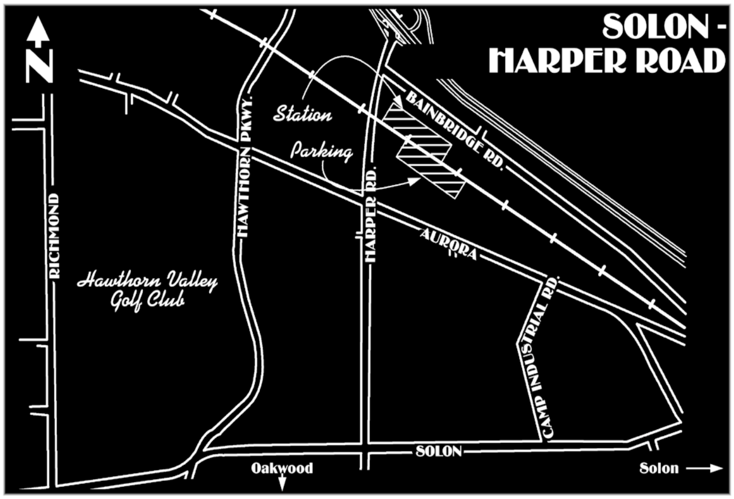
Access	◑
Parking	◑
Cost	◑
Market (Origin)	◑
Market (Destination)	○
Implementation	◑

Scale: ○lowest (worst) ●highest (best)



Solon
HARPER ROAD



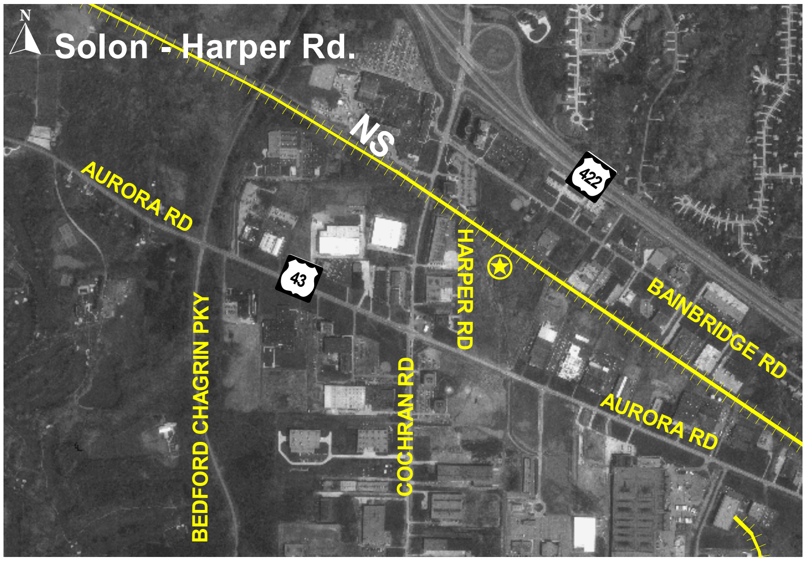


STATION DESCRIPTIONS

- **Route 6 - Southeast Corridor**
- **Station Type: Park-and-ride, local employment distribution**
- **Site: Harper Rd., north of SR 43, Solon**
- **Serves: Solon, Glenwillow, Orange**
- **Current Land Use: Vacant, industrial**
- **Railroad: NS Randall Secondary**
- **Configuration: Two side platforms, second track built through station**
- **Highway access: US 422, SR 43, Harper Rd., Cochran Rd.**

CONSTRAINTS/OPPORTUNITIES

- **Sufficient available land for park-and-ride**
- **Situated close to several major employers**
- **Convenient access from US 422**

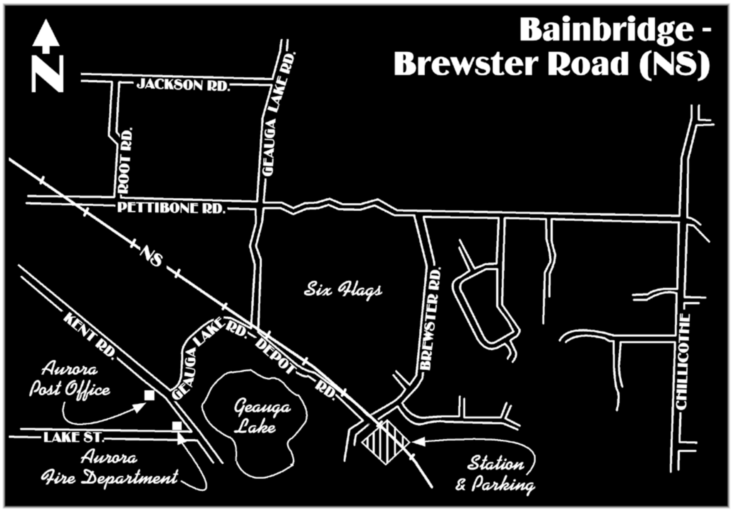


STATION RATINGS
(relative to alternative locations)

Access	●
Parking	●
Cost	◑
Market (Origin)	◑
Market (Destination)	●
Implementation	◑

Scale: ○lowest (worst) ●highest (best)

Bainbridge
BREWSTER ROAD

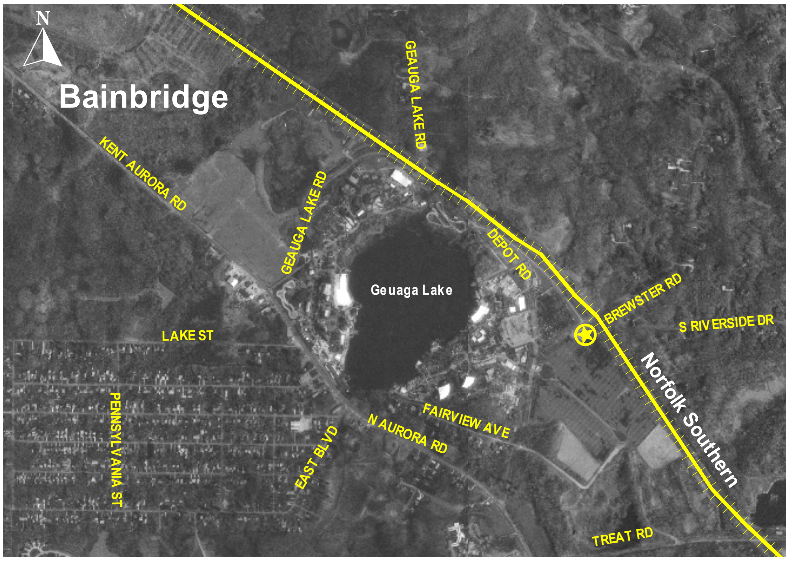


STATION DESCRIPTIONS

- Route 6 - Southeast Corridor
- Station Type: Park-and-ride
- Site: Brewster Rd., adjacent to Sea World parking lot, Bainbridge/Aurora
- Serves: Bainbridge, Aurora, Twinsburg, Sea World visitors and employees
- Current Land Use: Parking lot
- Railroad: NS Randall Secondary
- Configuration: Side platform, south side of tracks
- Highway access: SR 43

CONSTRAINTS/OPPORTUNITIES

- Uses portion of existing Sea World parking lot for commuter parking
- Convenient access from SR 43
- Walking distance (< 1,000 ft.) from Sea World front gate
- Pedestrian access improvements required

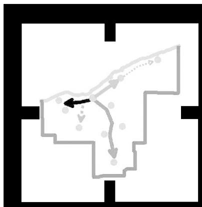


STATION RATINGS
(relative to alternative locations)

Access	◑
Parking	●
Cost	●
Market (Origin)	◑
Market (Destination)	●
Implementation	◑

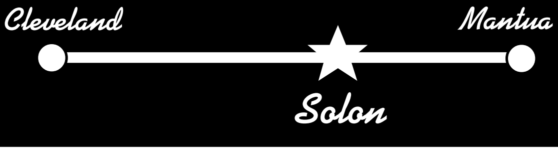
Scale: ○lowest (worst) ●highest (best)

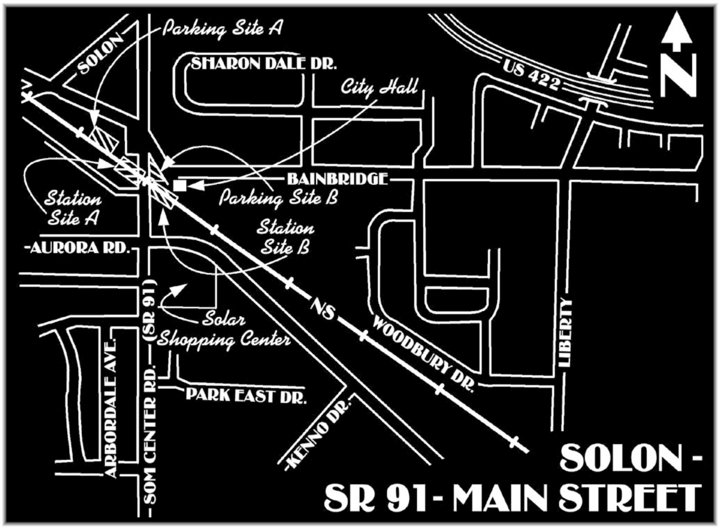
PB 100 YEARS SCATS AMATS NOACA Planning For Greater Cleveland



Solon

SR 91- MAIN STREET



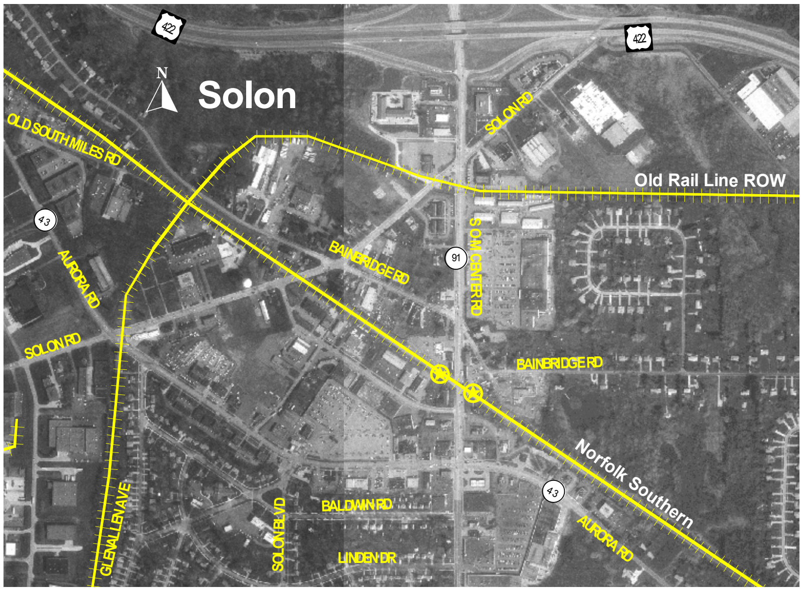


STATION DESCRIPTIONS

- **Route 6 - Southeast Corridor**
- **Station Type: Town center**
- **Site: SR 91-S.O.M. Center Rd., adjacent to Solon City Hall**
- **Serves: Solon, Twinsburg, Chagrin Falls, Bainbridge, Bentleyville, Moreland Hills**
- **Current Land Use: Parking lot, commercial, institutional**
- **Railroad: NS Randall Secondary**
- **Configuration: Two side platforms, second track built through station**
- **Highway access: US 422, SR 91, SR 43**

CONSTRAINTS/OPPORTUNITIES

- **Limited available land for park-and-ride**
- **Requires reconfiguration of existing parking lots**
- **Joint development potential**

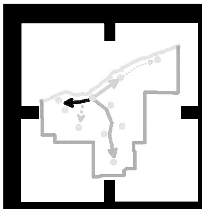


STATION RATINGS

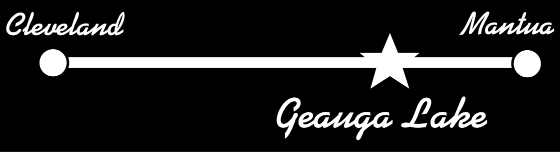
(relative to alternative locations)

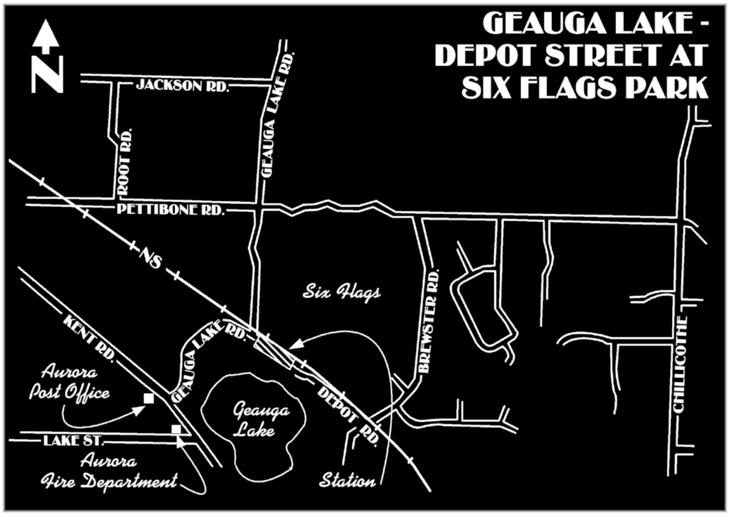
Access	◑
Parking	◑
Cost	◑
Market (Origin)	●
Market (Destination)	◑
Implementation	◑

Scale: ○lowest (worst) ●highest (best)



Geauga Lake
DEPOT STREET AT SIX FLAGS PARK



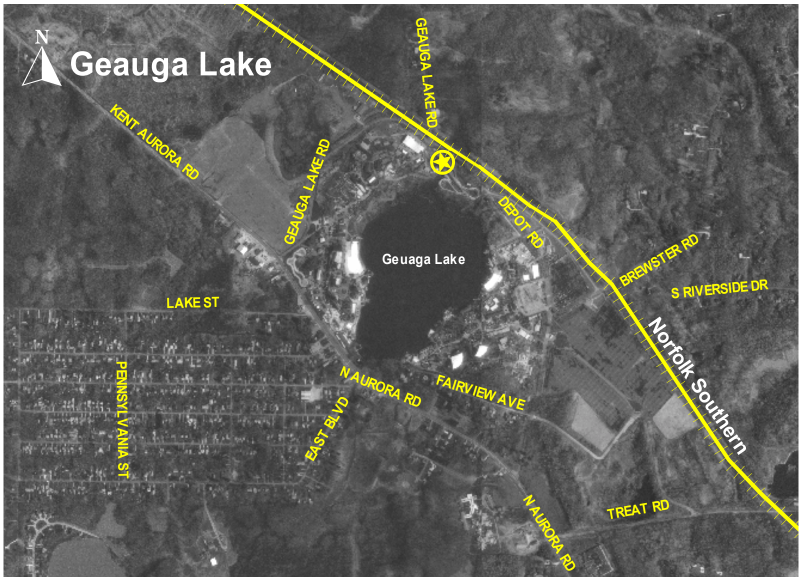


STATION DESCRIPTIONS

- **Route 6 - Southeast Corridor**
- **Station Type: Special (limited service)**
- **Site: Depot Rd. & Geauga Lake Rd., adjacent to Six Flags amusement park north entrance, Bainbridge**
- **Serves: Six Flags' visitors and employees**
- **Current Land Use: Vacant, former station building**
- **Railroad: NS Randall Secondary**
- **Configuration: Side platform, south side of tracks**
- **Highway access: N.A.**

CONSTRAINTS/OPPORTUNITIES

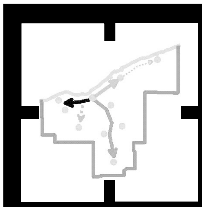
- **Limited rail service at this station (to serve amusement park visitors and employees)**
- **No park-and-ride facilities**
- **Shuttle bus pick-up and drop-off facilities**



STATION RATINGS
(relative to alternative locations)

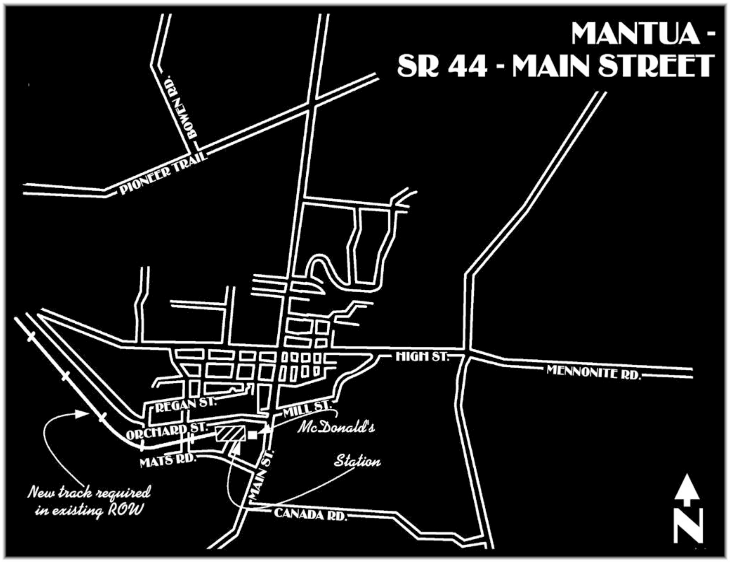
Access	●
Parking	N/A
Cost	●
Market (Origin)	N/A
Market (Destination)	●
Implementation	◐

Scale: ○ lowest (worst) ● highest (best)



Mantua

SR 44 - MAIN STREET



STATION DESCRIPTIONS

- **Route 6 - Southeast Corridor**
- **Station Type: Town Center, park-and-ride**
- **Site: SR 44 - Main St. at Orchard St., Mantua**
- **Serves: Mantua, Shalersville, Garrettsville, points east via turnpike**
- **Current Land Use: Vacant, with adjacent residential, commercial**
- **Railroad: NS Randall Secondary**
- **Configuration: Two tracks, island plat-**

CONSTRAINTS/OPPORTUNITIES

- **Requires 3-mile track extension from current end of line**
- **Convenient access from SR 44 and Ohio Turnpike**
- **Right-of-way at Main St. occupied by McDonald's restaurant parking lot**
- **Requires good signage and pedestrian walkway to Main St.**

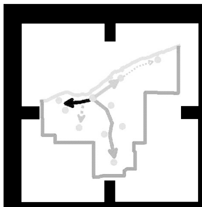
No aerial photography available

STATION RATINGS

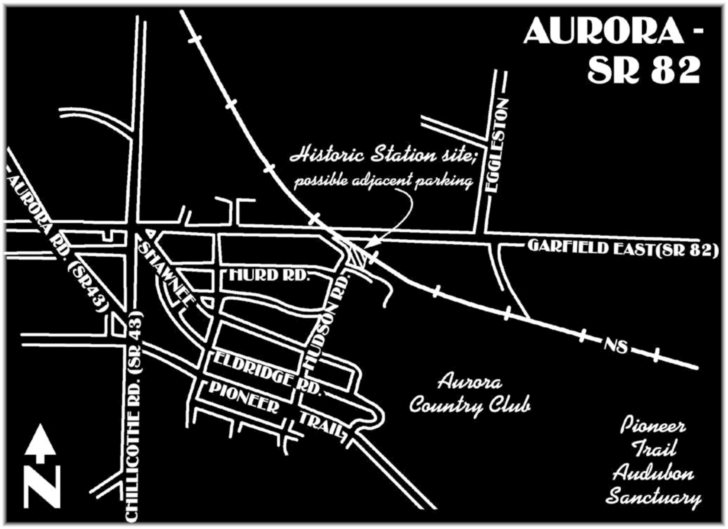
(relative to alternative locations)

Access	◑
Parking	◑
Cost	◑
Market (Origin)	◑
Market (Destination)	○
Implementation	◑

Scale: ○lowest (worst) ●highest (best)



Aurora
SR 82

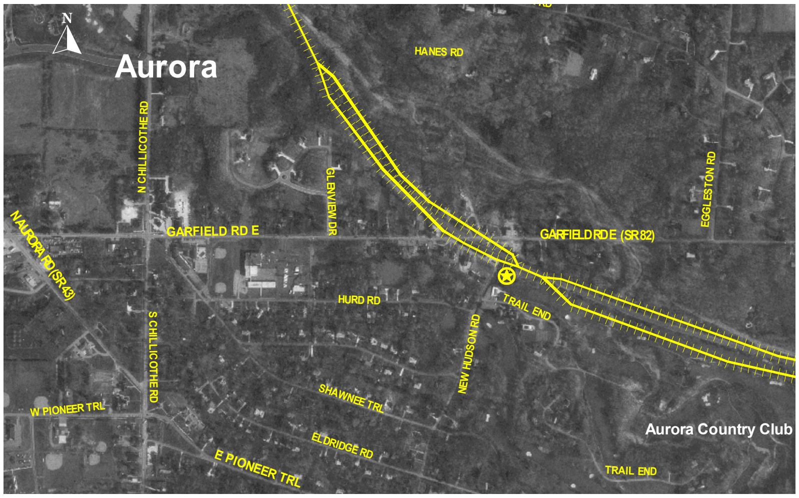


STATION DESCRIPTIONS

- Route 6 - Southeast Corridor
- Station Type: Park-and-ride
- Site: SR 82, Aurora
- Serves: Aurora, Streetsboro, Kent, Mantua
- Current Land Use: Parking lot, former station building
- Railroad: NS Randall Secondary
- Configuration: Side platform, south side of tracks
- Highway access: SR 82-Garfield East Rd.

CONSTRAINTS/OPPORTUNITIES

- Limited available land for park-and-ride
- Situated away from town center
- Not easily accessed from major regional highways
- Joint development potential



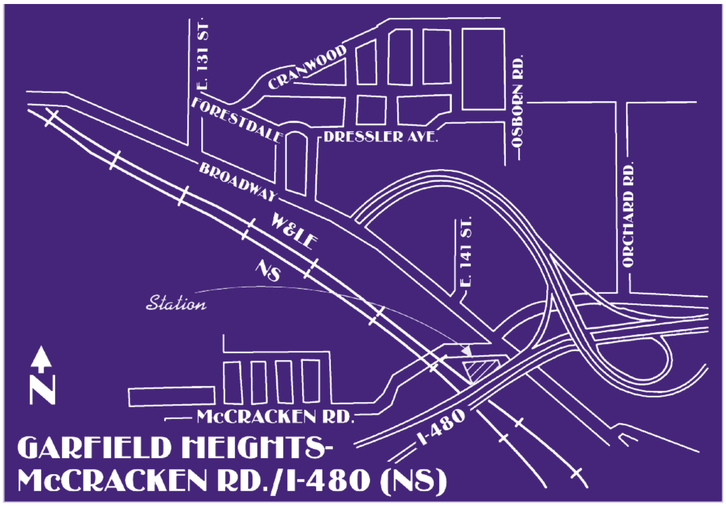
STATION RATINGS
(relative to alternative locations)

Access	◑
Parking	◑
Cost	●
Market (Origin)	◑
Market (Destination)	●
Implementation	◑

Scale: ○lowest (worst) ●highest (best)

Garfield Heights
McCRACKEN RD./I-480

Cleveland — Garfield Heights — Akron

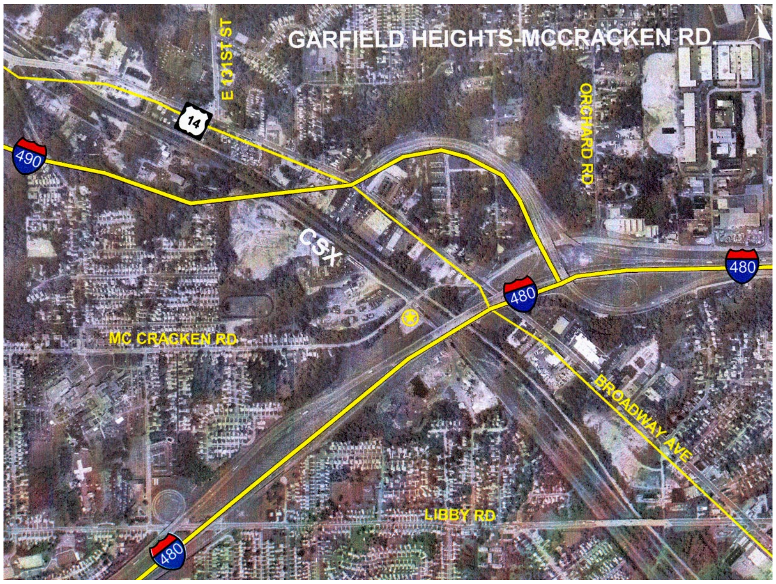


STATION DESCRIPTIONS

- **Route:** CAC Phase I
- **Station Type:** Park-and-Ride
- **Site:** I-480/McCracken
- **Serves:** Maple Hts., Garfield Hts.
- **Current Land Use:** Vacant
- **Railroad:** NS Cleveland Line, W&LE
- **Configuration:** Side Platform
- **Highway access:** I-480, I-271, I-77

CONSTRAINTS/OPPORTUNITIES

- Visible from I-480
- Relatively easy access for commuters traveling on I-480 west toward Downtown Cleveland
- Heavy level of freight traffic on NS line; light traffic on W&LE line
- Small vacant lots north & south of McCracken, potentially available for park-and-ride lot



STATION RATINGS
(relative to alternative locations)

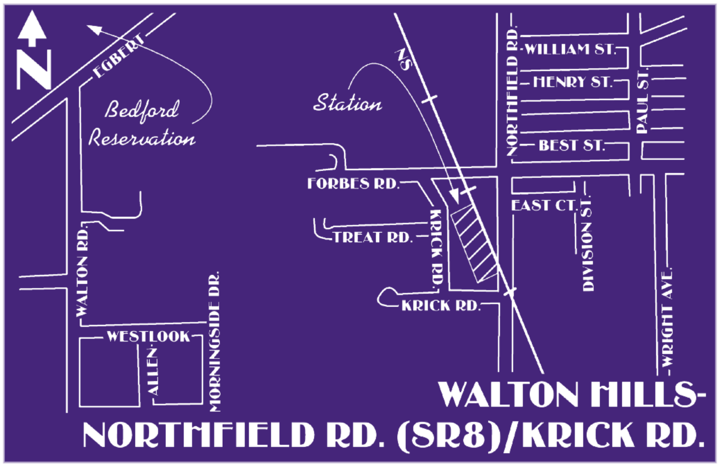
Access	◕
Parking	◕
Cost	◑
Market (Origin)	◑
Market (Destination)	◔
Implementation	◑

Scale: ○ lowest (worst) ● highest (best)

Walton Hills

NORTHFIELD RD.

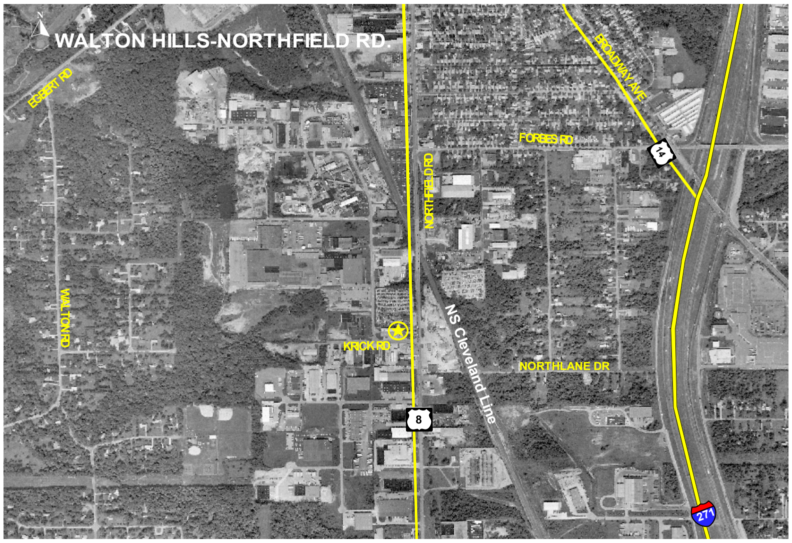
STATION DESCRIPTIONS



- **Route: CAC Phase I**
- **Station Type: Park-and-Ride in industrial area**
- **Site: North of Krick Rd. (along & under SR 8/Northfield Rd.)**
- **Serves: Walton Hills, Northfield**
- **Current Land Use: Industrial and commercial**
- **Railroad: NS Cleveland Line**
- **Configuration: Side Platform**
- **Highway access: I-480, I-271- Forbes Rd. exit**

CONSTRAINTS/OPPORTUNITIES

- **Heavily built-up industrial/commercial area constrains station and potential development**
- **SR 8 overpass makes access problematic**
- **Heavy level of freight traffic; 3rd main track required for passenger stops**
- **Due to factors including low ridership and relative proximity to adjacent stations, this station site was not recommended for development in this phase of the study**



STATION RATINGS

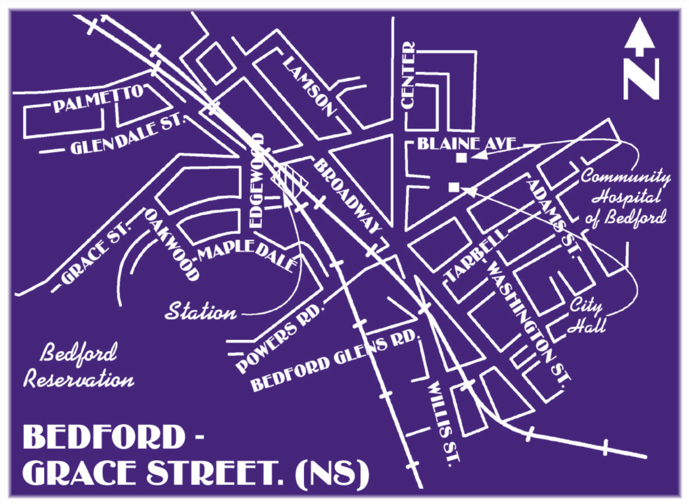
(relative to alternative locations)

Access	◑
Parking	○
Cost	◔
Market (Origin)	◑
Market (Destination)	◑
Implementation	◔

Scale: ○lowest (worst) ●highest (best)

CAC TRANS

Bedford
GRACE STREET

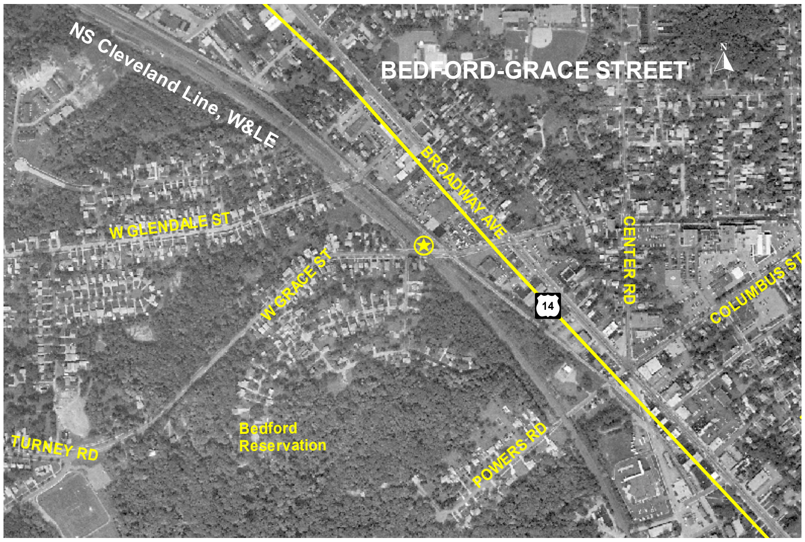


STATION DESCRIPTIONS

- **Route: CAC Phase I**
- **Station Type: Town Center, Park-and-Ride**
- **Site: Grace St., southwest of Broadway**
- **Serves: Bedford, Bedford Hts., Warrensville Hts**
- **Current Land Use:**
- **Railroad: NS Cleveland Line, W&LE**
- **Configuration: Side paltforms in between the two rail lines**
- **Highway access: SR 8, SR 14, i-271**

CONSTRAINTS/OPPORTUNITIES

- **Heavy level of freight traffic**
- **Track connection and interlocking required between NS and W&LE lines**
- **Sufficient space for station**
- **Good access**
- **Developable location**
- **Suitable park-and-ride site**



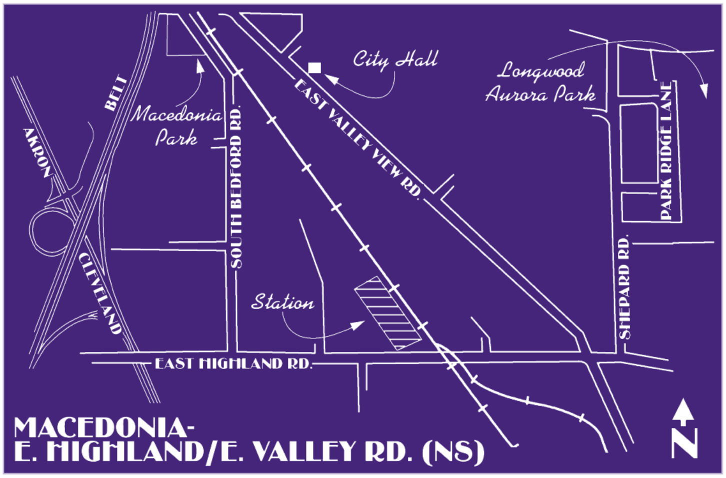
STATION RATINGS
(relative to alternative locations)

Access	●
Parking	◑
Cost	◑
Market (Origin)	◕
Market (Destination)	◑
Implementation	●

Scale: ○ lowest (worst) ● highest (best)

PB 100 YEARS SCATS SARTA AMATS METRO NOACA Planning For Greater Cleveland RTA Greater Cleveland Regional Transit Authority

Macedonia
E. HIGHLAND

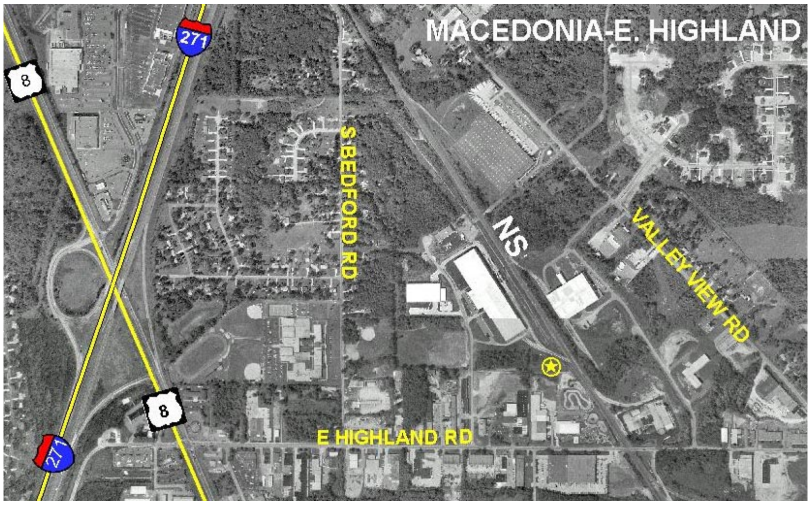


STATION DESCRIPTIONS

- **Route: CAC Phase I**
- **Station Type: Park-and-Ride**
- **Site: E. Highland Rd, between I-271 and E. Valley View Rd., south of SR 82**
- **Serves: Macedonia, Twinsburg, Aurora**
- **Current Land Use: Industrial**
- **Railroad: NS Cleveland Line**
- **Configuration: Side Platform**
- **Highway access: SR 82, I-271, SR 8**

CONSTRAINTS/OPPORTUNITIES

- **Very active freight yard near station location**
- **Heavy level of freight traffic**
- **3rd main track and interlocking required in vicinity of station**
- **Grade-separation of highway crossing may be required**
- **Sufficient space for station along tracks**
- **Easily accessible for commuters**



STATION RATINGS

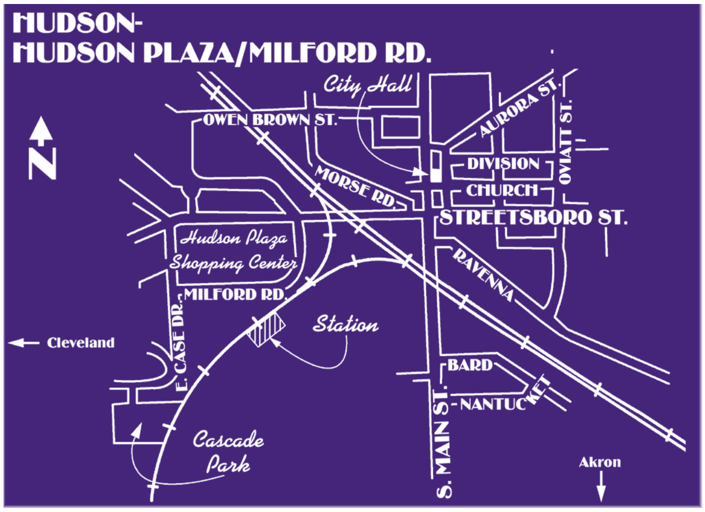
(relative to alternative locations)

Access	◕
Parking	◑
Cost	◔
Market (Origin)	◕
Market (Destination)	◕
Implementation	◑

Scale: ○ lowest (worst) ● highest (best)

Hudson

HUDSON PLAZA/MILFORD RD

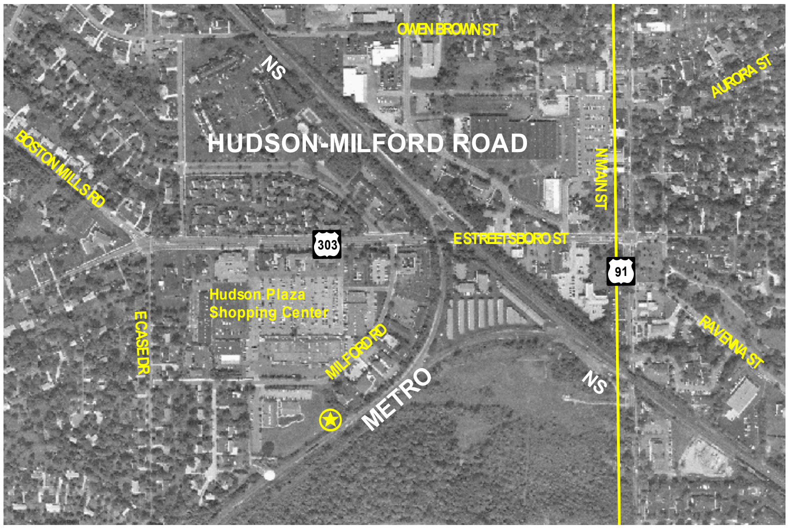


STATION DESCRIPTIONS

- Route: CAC Phase I
- Station Type: Town Center, and Park-and-Ride
- Site: Milford Rd. south of Hudson Plaza Shopping Center
- Serves: Hudson, Streetsboro, Boston Hts.
- Current Land Use: Commercial
- Railroad: METRO
- Configuration: Side Platform
- Highway access: I-80, SR 91, SR 8, SR 303

CONSTRAINTS/OPPORTUNITIES

- No freight traffic issues on METRO branch line
- Sufficient space for station and park-and-ride lot
- Near existing commercial center
- Easliy accessible for commuters
- Heavy local traffic
- May require relocation of existing commercial user



STATION RATINGS

(relative to alternative locations)

Access	◑
Parking	◑
Cost	◑
Market (Origin)	◕
Market (Destination)	◑
Implementation	◕

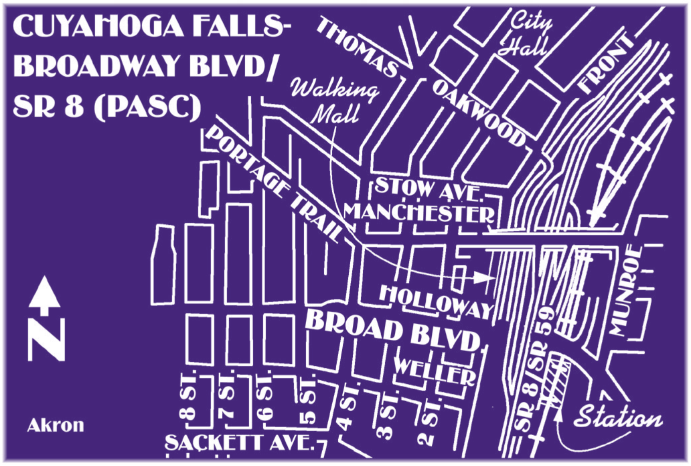
Scale: ○lowest (worst) ●highest (best)

CAC TRANS

Cuyahoga Falls
BROAD BLVD.

Cleveland ○———★——○ Akron

Cuyahoga Falls

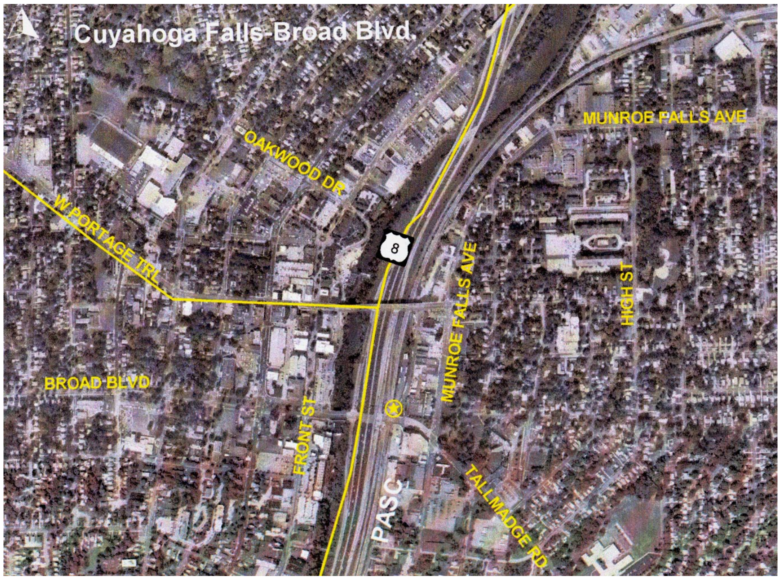


STATION DESCRIPTIONS

- **Route: CAC Phase I**
- **Station Type: Town Center**
- **Site: Broad Blvd., SR 8/SR 59**
- **Serves: Cuyahoga Falls, Munroe Falls, Stow, and Tallmadge**
- **Current Land Use: Industrial**
- **Railroad: METRO, CSX Newcastle Subdivision**
- **Configuration: Side Platform**
- **Highway access: SR 8, SR 59, SR 261**

CONSTRAINTS/OPPORTUNITIES

- **Not sufficient space for park-and-ride lot**
- **Good location for transit users, kiss-and-ride and walk access to Cuyahoga Falls**
- **May enhance redevlopment plans**



STATION RATINGS
(relative to alternative locations)

Access	●
Parking	◔
Cost	◕
Market (Origin)	◕
Market (Destination)	◑
Implementation	◕

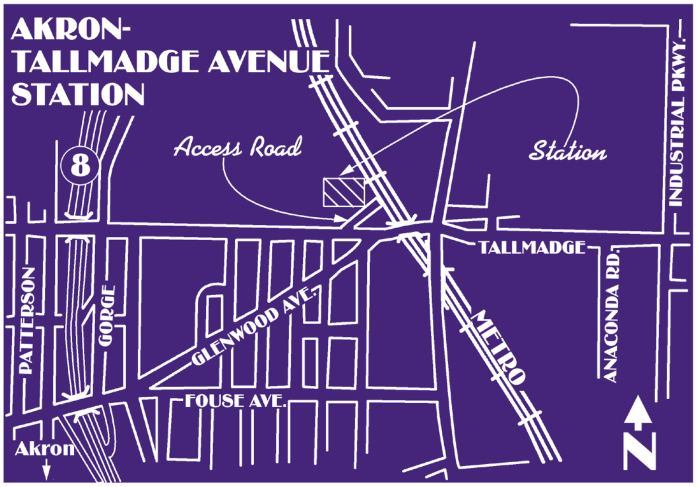
Scale: ○lowest (worst) ●highest (best)

Akron

TALLMADGE AVENUE

Cleveland

Akron

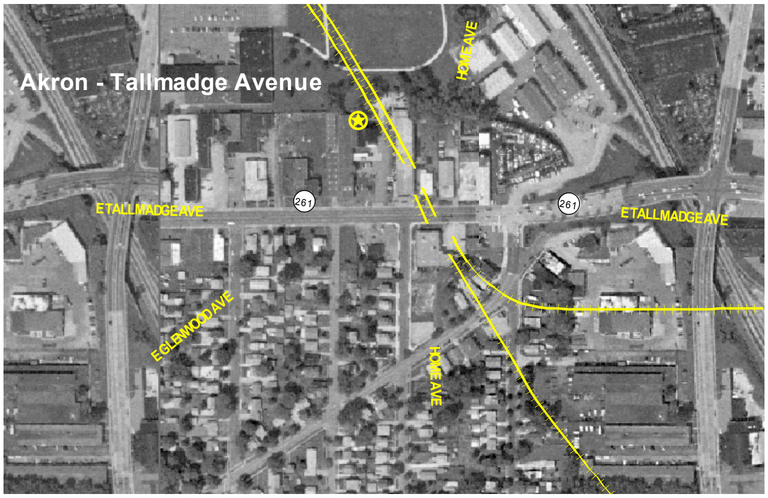


STATION DESCRIPTIONS

- **Route: CAC Phase I**
- **Station Type: Park-and-Ride**
- **Site: Tallmadge Ave. near Home Ave.**
- **Serves: Akron, Tallmadge, Mogadore**
- **Current Land Use: Commercial, Industrial**
- **Railroad: METRO**
- **Configuration: Side Platform**
- **Highway access: SR 8, SR 59, SR 261**

CONSTRAINTS/OPPORTUNITIES

- **Does not serve Downtown Akron directly**
- **Adjoining property may have to be purchased to build a park-and-ride lot**
- **Sufficient space for station**
- **Avoids high costs associated with crossing of CSX mainline between Arlington St. & Downtown Akron**



STATION RATINGS

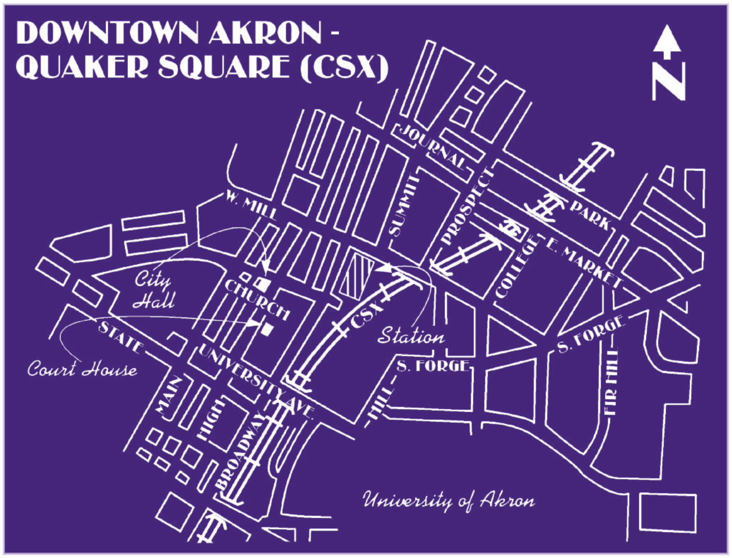
(relative to alternative locations)

Access	◑
Parking	◕
Cost	◕
Market (Origin)	◑
Market (Destination)	◔
Implementation	●

Scale: ○lowest (worst) ●highest (best)

Downtown Akron
QUAKER SQUARE

Cleveland
Akron

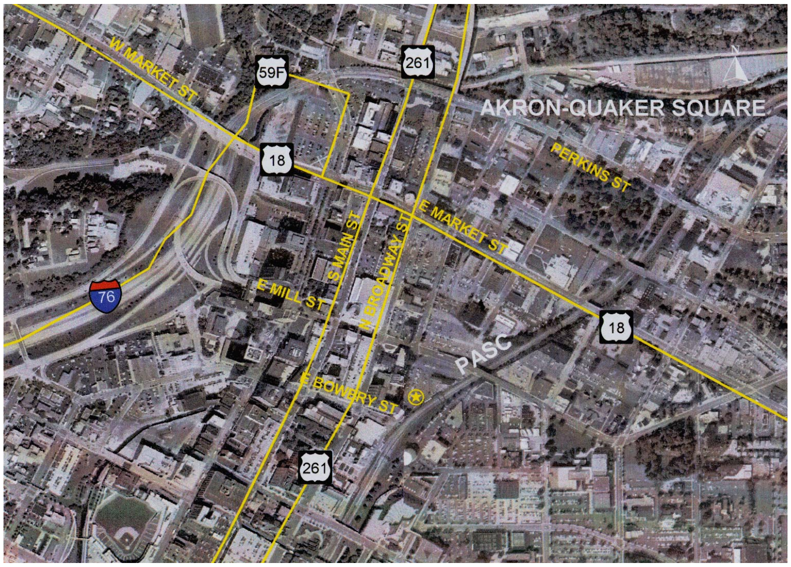


STATION DESCRIPTIONS

- **Route: CAC Phase II**
- **Station Type: Park-and-Ride, Town Center**
- **Site: Downtwon Akron**
- **Serves: Akron, Tallmadge, Mogadore**
- **Current Land Use: Commercial, Retail**
- **Railroad: METRO, CSX Newcastle Subdivision**
- **Configuration: Side Platform**
- **Highway access: SR 8, SR 59**

CONSTRAINTS/OPPORTUNITIES

- **Serves Downtown Akron and University of Akron**
- **Existing AMTRAK station**
- **Sufficient space for station**
- **High cost associated with crossing of CSX mainline between Arlington St. & Downtown Akron**
- **Train storage and servicing facilities required**

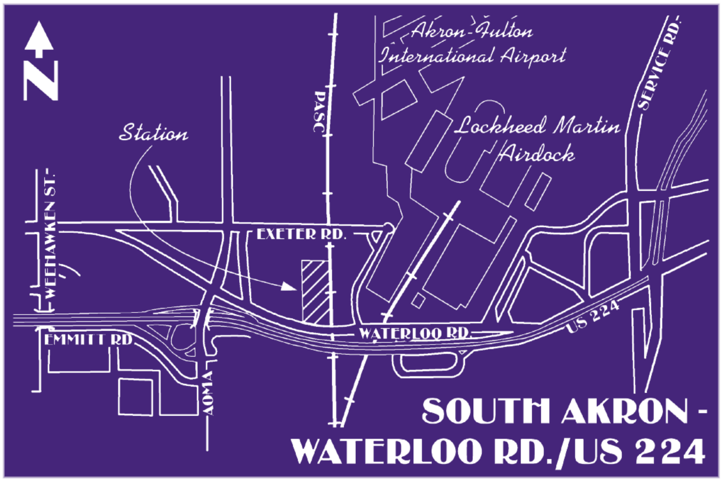


STATION RATINGS
(relative to alternative locations)

Access	◕
Parking	◑
Cost	◔
Market (Origin)	◑
Market (Destination)	◕
Implementation	◑

Scale: ○lowest (worst) ●highest (best)

South Akron
WATERLOO RD.

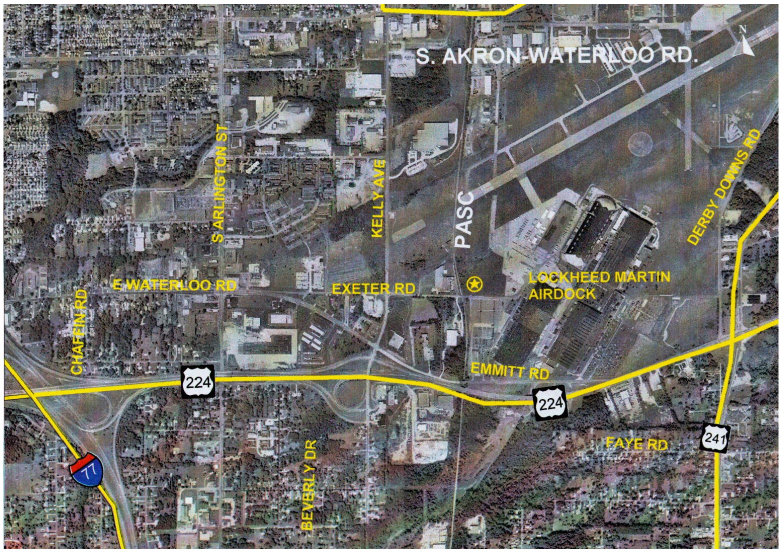


STATION DESCRIPTIONS

- **Route: CAC Phase II**
- **Station Type: Park-and-Ride**
- **Site: Waterloo Rd./US 224**
- **Serves: S. Akron, Coventry, Barberton**
- **Current Land Use: Industrial/Commercial**
- **Railroad: METRO**
- **Configuration: Side Platform**
- **Highway access: US 224, I-76, I-277**

CONSTRAINTS/OPPORTUNITIES

- **Sufficient sapce for a station and park-and-ride lot**
- **Good local highway access**



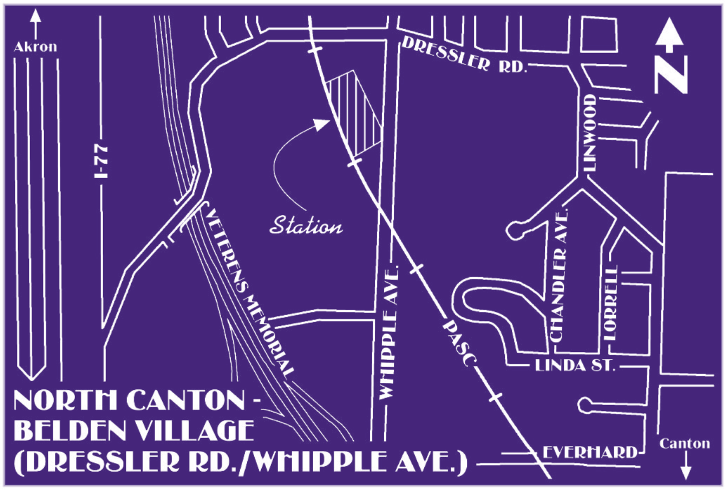
STATION RATINGS
(relative to alternative locations)

Access	◕
Parking	◑
Cost	◑
Market (Origin)	◑
Market (Destination)	◔
Implementation	◑

Scale: ○lowest (worst) ●highest (best)

Belden Village

DRESSLER RD.

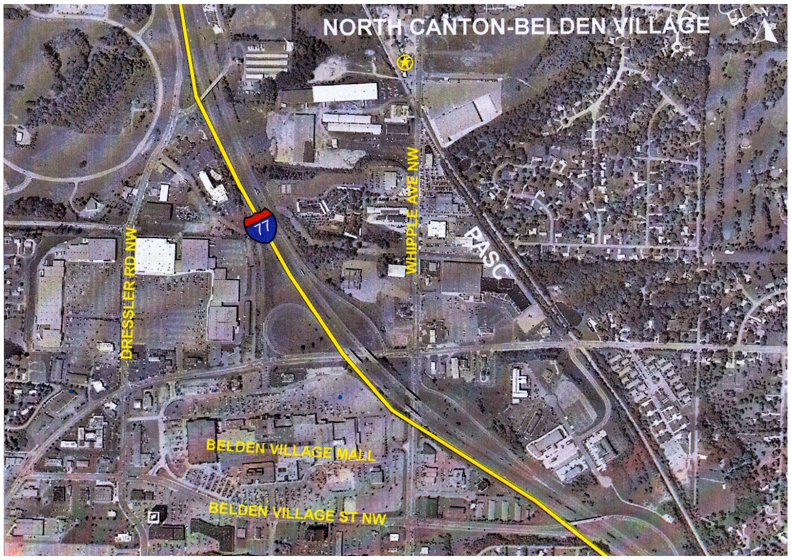


STATION DESCRIPTIONS

- **Route: CAC Phase II**
- **Station Type: Park-and-Ride**
- **Site: Dressler Rd./Whipple Ave.**
- **Serves: North Canton, Jackson Twnshp**
- **Current Land Use: Industrial/Commercial**
- **Railroad: METRO**
- **Configuration: Side Platform**
- **Highway access: I-77, SR 297**

CONSTRAINTS/OPPORTUNITIES

- **Sufficient space for station and park-and-ride lot**
- **Good local highway access**
- **Proximity to existing commercial center**
- **No existing transfer service to shopping center**



STATION RATINGS

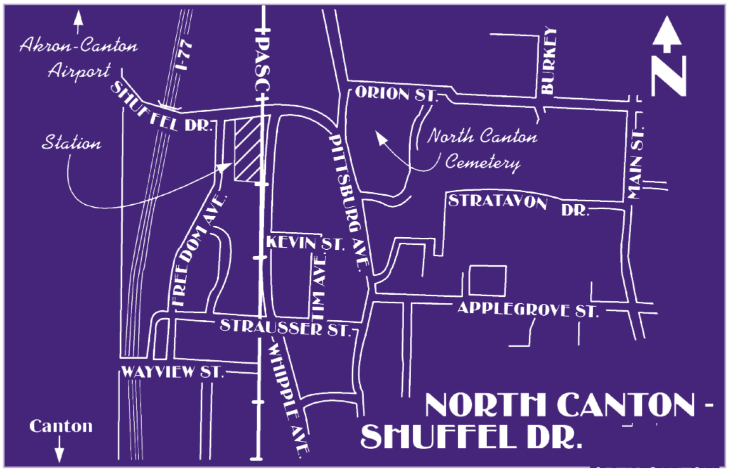
(relative to alternative locations)

Access	◕
Parking	◑
Cost	◑
Market (Origin)	◑
Market (Destination)	◑
Implementation	◑

Scale: ○ lowest (worst) ● highest (best)

North Canton

SHUFFEL DR.

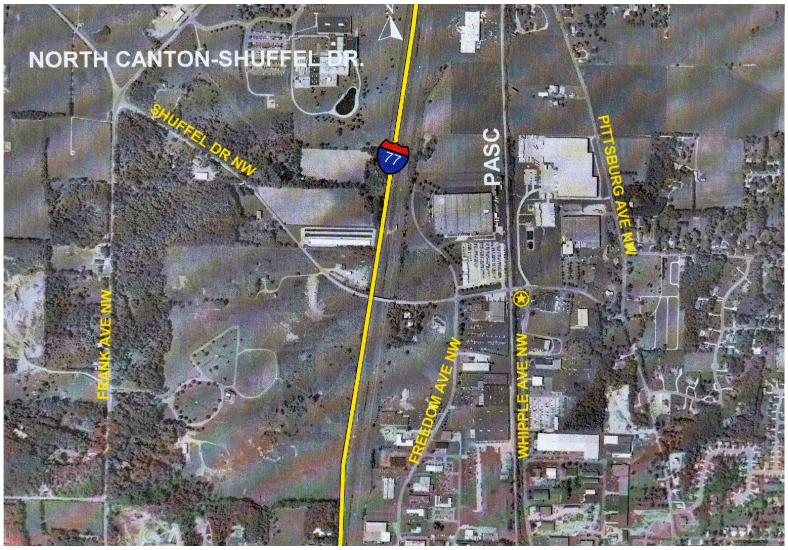


STATION DESCRIPTIONS

- **Route: CAC Phase II**
- **Station Type: Park-and-Ride**
- **Site: Shuffel Dr/Whipple Ave.**
- **Serves: N. Canton, Jackson Twnshp**
- **Current Land Use: Industrial/Commercial**
- **Railroad: METRO**
- **Configuration: Side Platform**
- **Highway access: I-77, SR 297**

CONSTRAINTS/OPPORTUNITIES

- **Sufficient space for station and park-and-ride lot**
- **Good local highway access when interchange is complete**
- **Industrial/commercial area, limited walk access to adjacent sites**



STATION RATINGS

(relative to alternative locations)

Access	◑
Parking	◑
Cost	◑
Market (Origin)	◑
Market (Destination)	◔
Implementation	◑

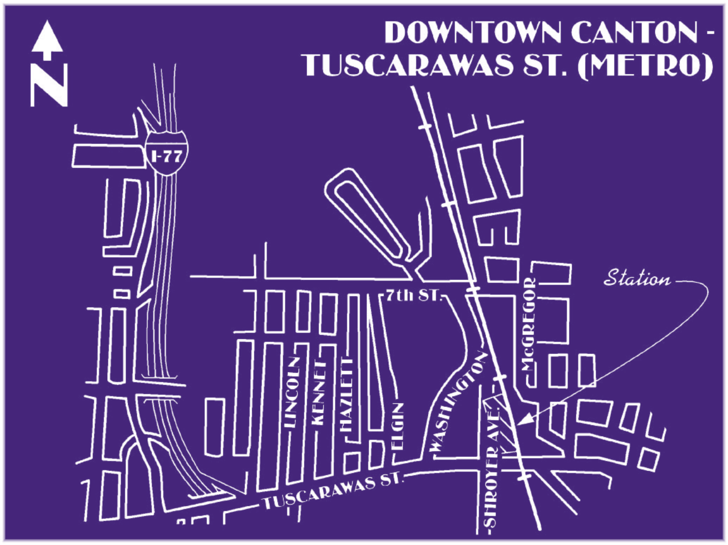
Scale: ○lowest (worst) ●highest (best)

Downtown Canton

TUSCARAWAS ST.

Akron

Canton

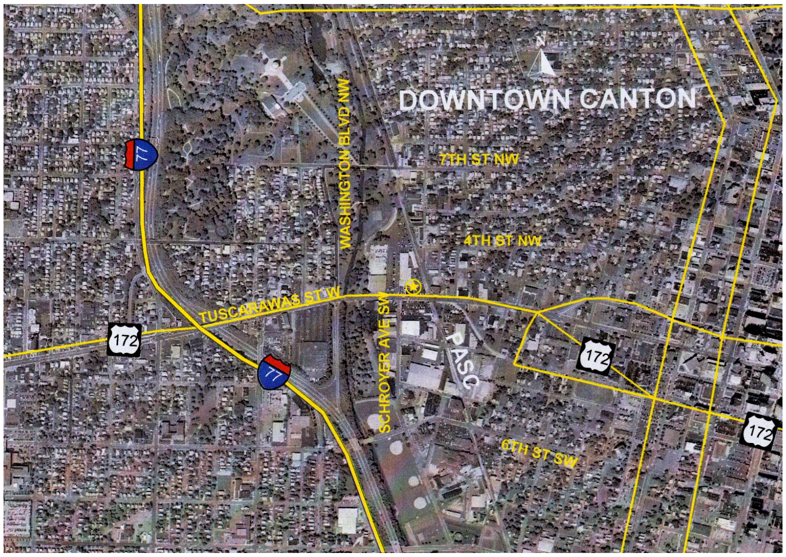


STATION DESCRIPTIONS

- **Route: CAC Phase II**
- **Station Type: Park-and-Ride, Town Center**
- **Site: Downtown Canton**
- **Serves: Canton, Green**
- **Current Land Use: Commercial**
- **Railroad: METRO**
- **Configuration: Side Platform**
- **Highway access: I-77, US 62, SR 43**

CONSTRAINTS/OPPORTUNITIES

- **Serves Dowtown Canton**
- **Limited space for park-and-ride lot**
- **Sufficient space for station**
- **Station area development potential**

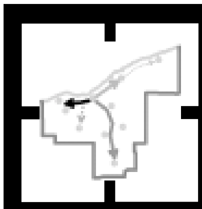


STATION RATINGS

(relative to alternative locations)

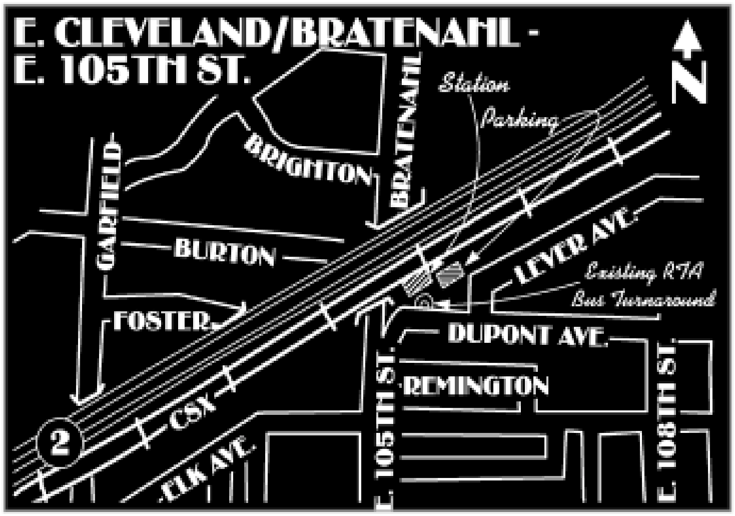
Access	◑
Parking	◔
Cost	◑
Market (Origin)	◔
Market (Destination)	◔
Implementation	◑

Scale: ○ lowest (worst) ● highest (best)



East Cleveland/ Bratenahl

EAST 105TH ST.

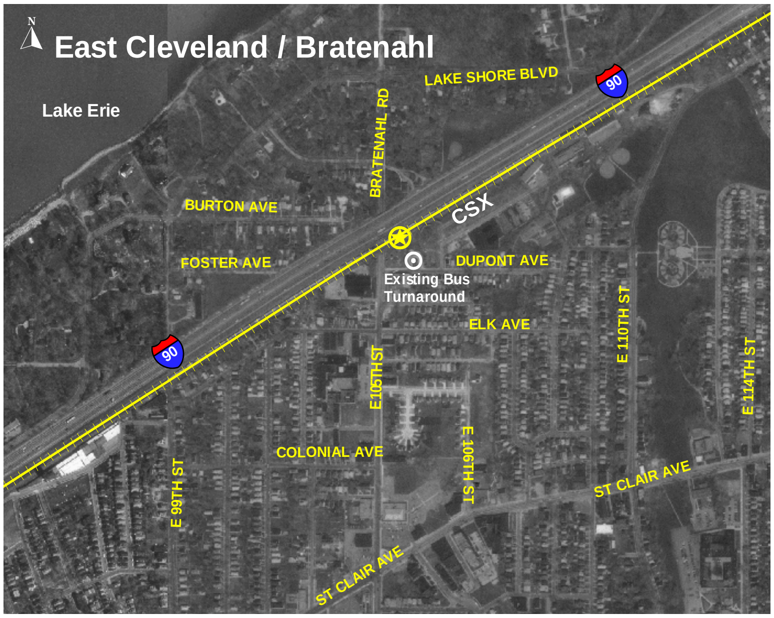


STATION DESCRIPTIONS

- Route 7 - Lake East Corridor
- Station Type: Urban, bus transfer station
- Site: E. 105th St. & Dupont Ave., Cleveland
- Serves: Cleveland east side, East Cleveland, Bratenahl
- Current Land Use: Parking lot (private) & RTA bus turnaround facility
- Railroad: CSX Cleveland-Buffalo Line
- Configuration: Side plus island platform
- Highway access: I-90/SR 2 at Eddy Rd.

CONSTRAINTS/OPPORTUNITIES

- Existing parking lot canbe modified to serve station
- Land must be acquired from private owner (Hickok)
- Transfer to and from local GCRTA bus routes
- Adjacent to residential neighborhood

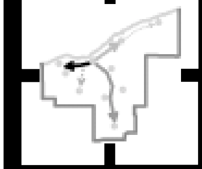


STATION RATINGS

(relative to alternative locations)

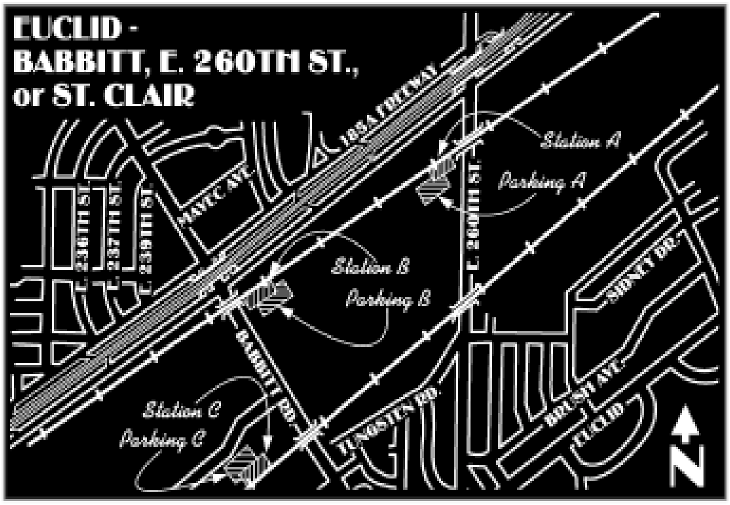
Access	◑
Parking	◑
Cost	◑
Market (Origin)	◑
Market (Destination)	○
Implementation	◑

Scale: ○lowest (worst) ●highest (best)



Euclid

BABBITT RD.

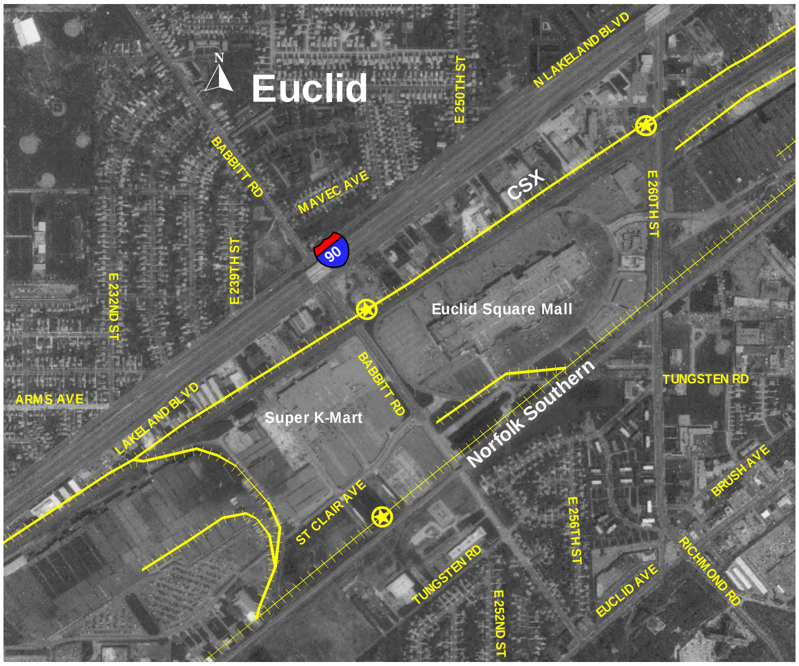


STATION DESCRIPTIONS

- Route 7 – Lake East Corridor
- Station Type: Park-and-ride
- Site: Euclid Square Mall, Babbitt Rd.
- Serves: Euclid, Richmond Hts., Highland Hts.
- Current Land Use: Shopping center parking lot
- Railroad: CSX Cleveland-Buffalo Line
- Configuration: Side platform
- Highway access: I-90/SR 2, US 20

CONSTRAINTS/OPPORTUNITIES

- Underutilized parking available at mall site
- Existing express bus service to downtown Cleveland
- Adjacent to I-90/SR 2

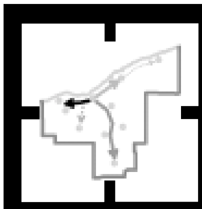


STATION RATINGS

(relative to alternative locations)

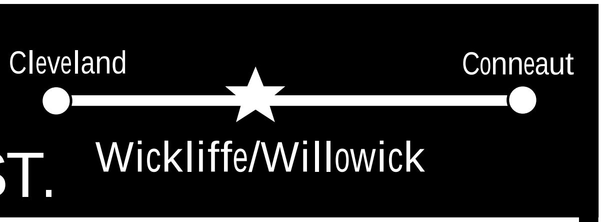
Access	●
Parking	●
Cost	◑
Market (Origin)	◑
Market (Destination)	○
Implementation	◑

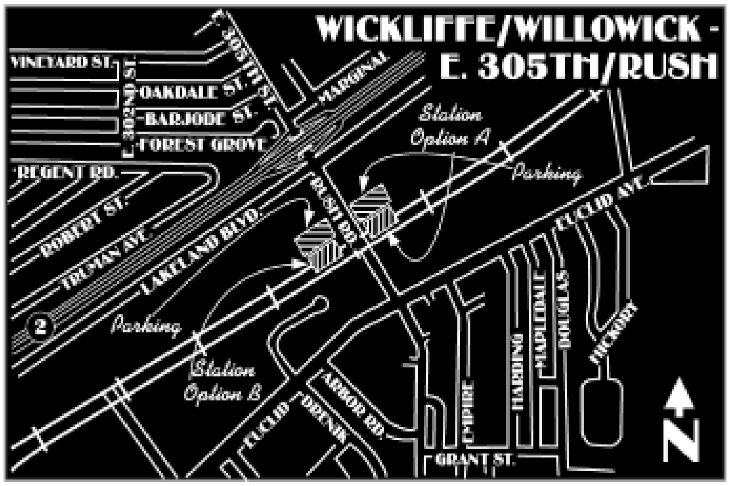
Scale: ○lowest (worst) ●highest (best)



Wickliffe/Willowick

RUSH RD., E. 305th ST.



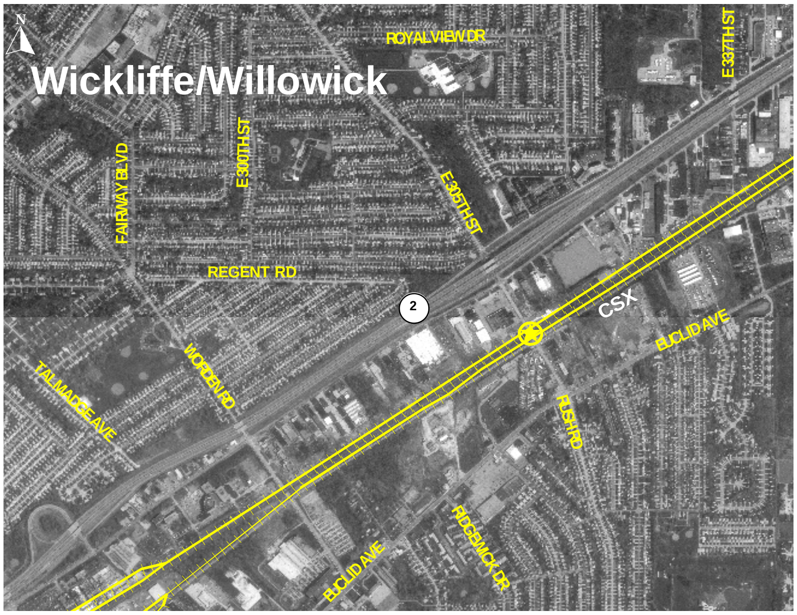


STATION DESCRIPTIONS

- Route 7: Lake East Corridor
- Station Type: Park-and-ride
- Site: Rush Rd. (E. 305th St.), Wickliffe
- Serves: Wickliffe, Willowick, Willoughby Hills, Lakeline
- Current Land Use: Commercial/ industrial
- Railroad: CSX Cleveland-Buffalo Line
- Configuration: Island platform
- Highway access: SR 2, US 20

CONSTRAINTS/OPPORTUNITIES

- Centrally-located with respect to residential neighborhoods
- Close proximity to SR 2
- Requires acquisition of commercial/ industrial property for parking

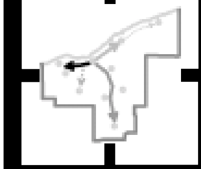


STATION RATINGS

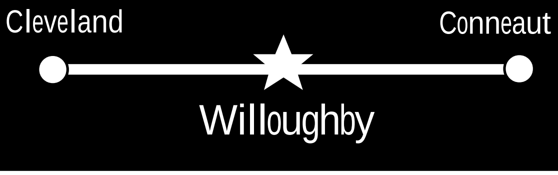
(relative to alternative locations)

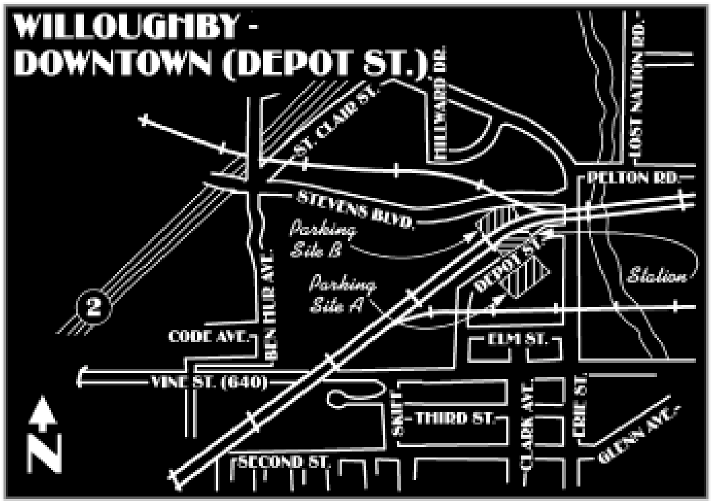
Access	●
Parking	○
Cost	◑
Market (Origin)	◑
Market (Destination)	○
Implementation	◑

Scale: ○lowest (worst) ●highest (best)



Willoughby
DEPOT ST.



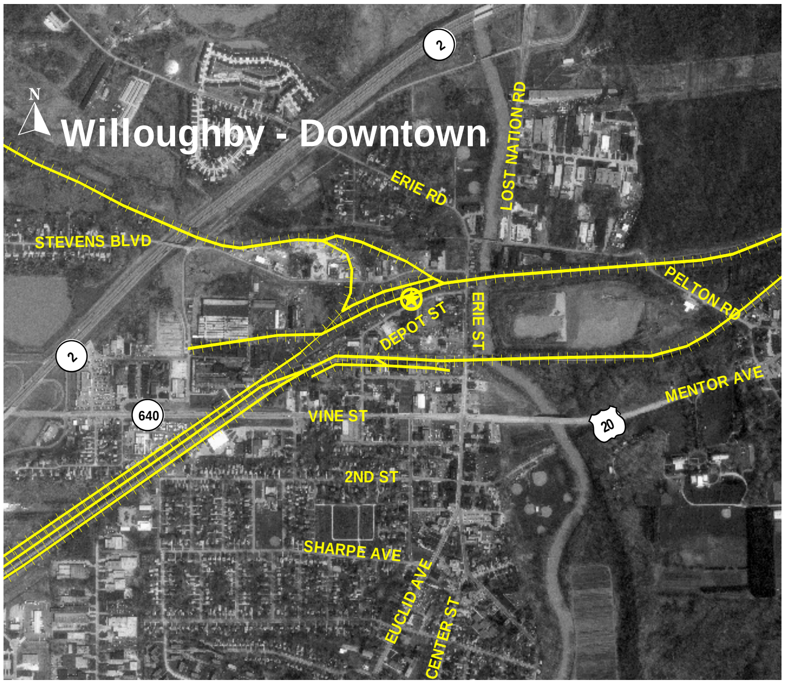


STATION DESCRIPTIONS

- Route 7: Lake East Corridor
- Station Type: Town center, limited park-and-ride
- Site: Erie St. at Depot St., Willoughby
- Serves: Willoughby, Eastlake, Willoughby Hills, Lakeline, Waite Hill
- Current Land Use: Industrial
- Railroad: CSX Cleveland-Buffalo Line
- Configuration: Side platform
- Highway access: US 20, SR 2, Lost Nation Rd.

CONSTRAINTS/OPPORTUNITIES

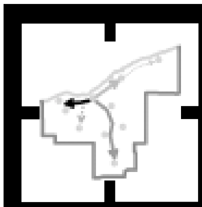
- Historic station site, close to Willoughby business district
- Good station area development potential
- Awkward highway access



STATION RATINGS
(relative to alternative locations)

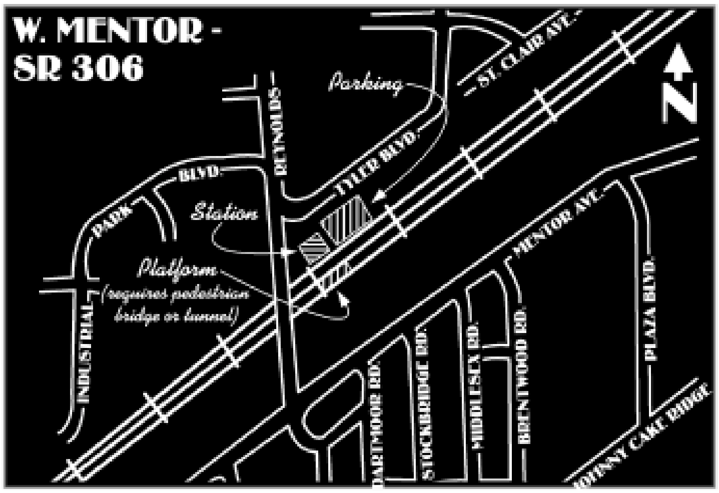
Access	○
Parking	◑
Cost	◑
Market (Origin)	◑
Market (Destination)	○
Implementation	◑

Scale: ○lowest (worst) ●highest (best)



W. Mentor

REYNOLDS RD. - SR 306

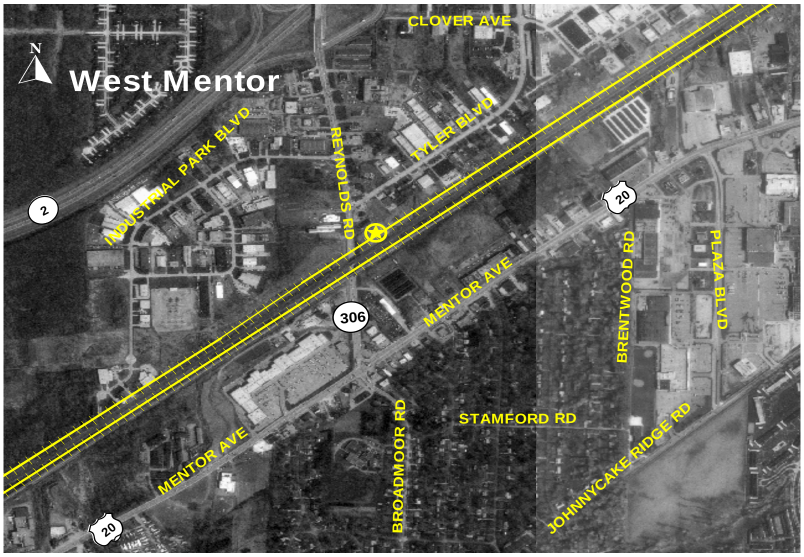


STATION DESCRIPTIONS

- Route 7: Lake East Corridor
- Station Type: Park-and-ride,
- Site: SR 306 - Reynolds Rd.
- Serves: Mentor, Willoughby, Eastlake, Lakeline, Timberlake
- Current Land Use: Commercial/ industrial
- Railroad: CSX Cleveland-Buffalo Line
- Configuration: Island platform
- Highway access: SR 2, US 20

CONSTRAINTS/OPPORTUNITIES

- Close proximity to SR 2
- Limited land available for parking
- Station site relatively close to Mentor station

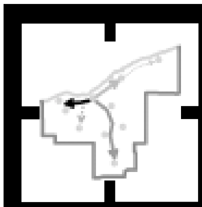


STATION RATINGS

(relative to alternative locations)

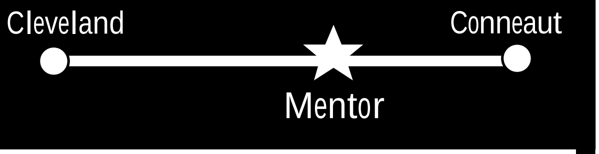
Access	◐
Parking	◐
Cost	◐
Market (Origin)	◐
Market (Destination)	○
Implementation	◐

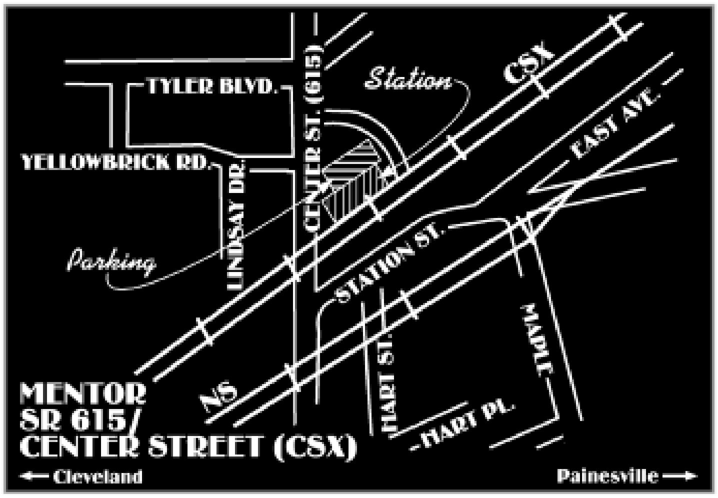
Scale: ○ lowest (worst) ● highest (best)



Mentor

CENTER ST. - SR 615



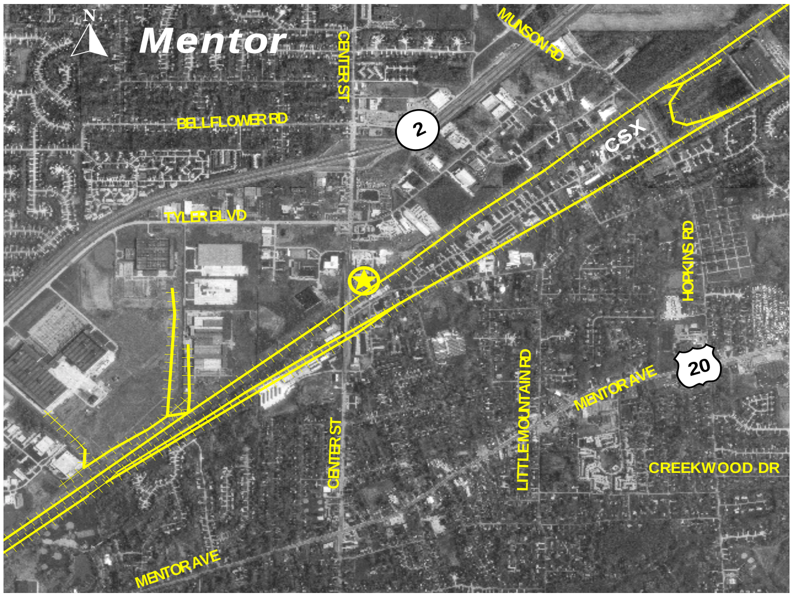


STATION DESCRIPTIONS

- Route 7 – Lake East Corridor
- Station Type: Park-and-ride
- Site: Center St. and Station St., Mentor
- Serves: Mentor, Kirtland Hills, Kirtland, Mentor-on-the-lake
- Current Land Use: Commercial/industrial
- Railroad: CSX Cleveland-Buffalo Line
- Configuration: Island platform
- Highway access: SR 2, US 20

CONSTRAINTS/OPPORTUNITIES

- Centrally-located with respect to Mentor and Kirtland residential neighborhoods
- Growing residential area
- Good highway access from SR 2, US 20, SR 84, and SR 615
- Former station site
- Land available for parking



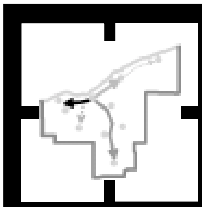
STATION RATINGS

(relative to alternative locations)

Access	●
Parking	●
Cost	◐
Market (Origin)	◐
Market (Destination)	○
Implementation	◐

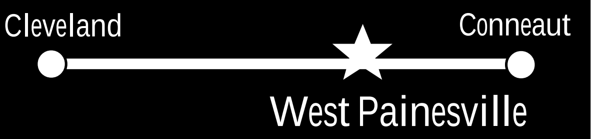
Scale: ○ lowest (worst) ● highest (best)

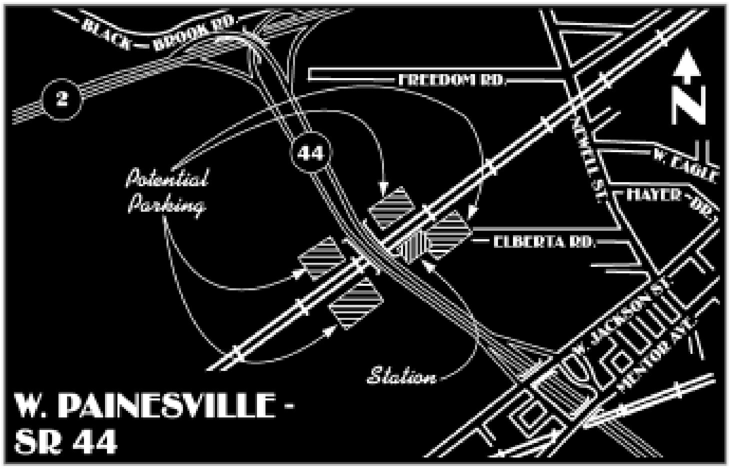
PB SCATS AMATS NOACA Planning For Greater Cleveland



West Painesville

SR 44



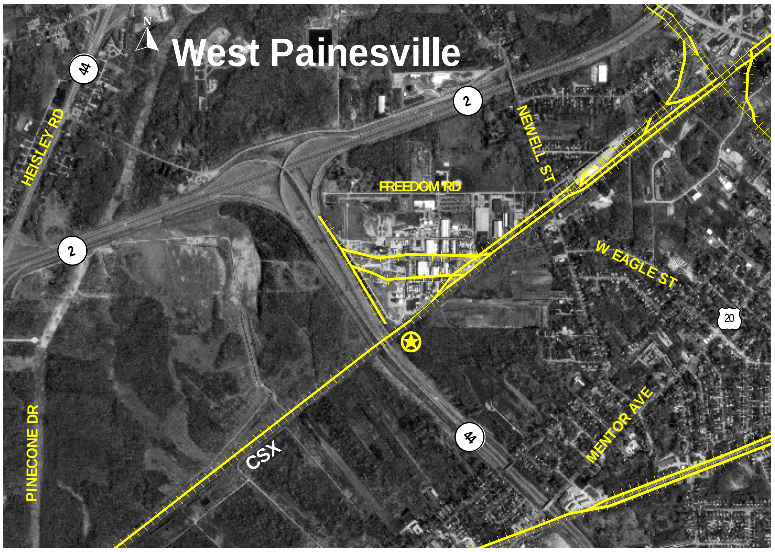


STATION DESCRIPTIONS

- Route 7 - Lake East Corridor
- Station Type: Park-and-ride
- Site: SR 44, Painesville Township
- Serves: Painesville, Grand River, Fairport, Chardon, Concord
- Current Land Use: Vacant
- Railroad: CSX Cleveland-Buffalo Line
- Configuration: Side platform
- Highway access: SR 44, SR 2, SR 84

CONSTRAINTS/OPPORTUNITIES

- New residential development in station vicinity: potential for transit-oriented development
- Land available for parking
- Good highway access from SR 44, SR 2, and SR 84
- Requires new interchange on SR 44
- Requires modification of area development plans

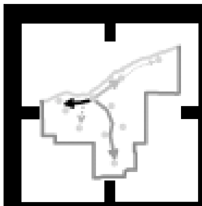


STATION RATINGS

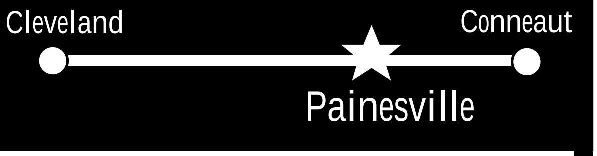
(relative to alternative locations)

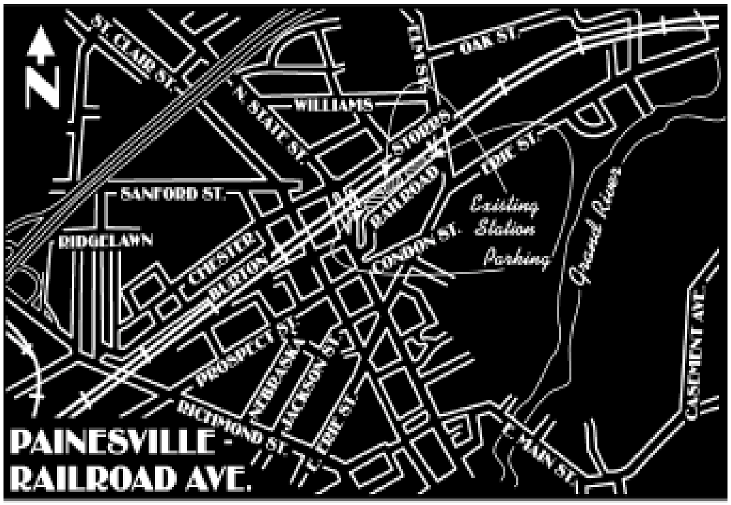
Access	●
Parking	●
Cost	○
Market (Origin)	●
Market (Destination)	○
Implementation	○

Scale: ○lowest (worst) ●highest (best)



Painesville
RAILROAD AVE.



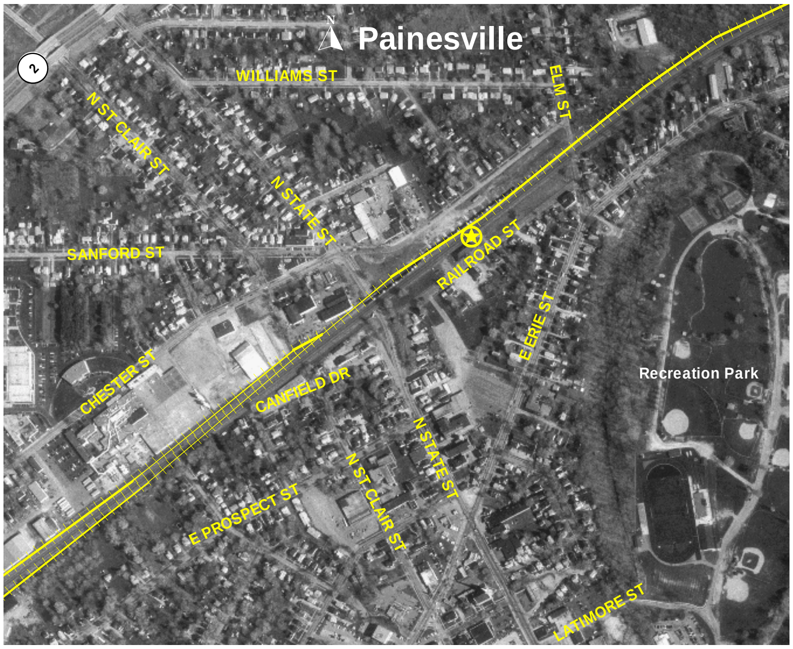


STATION DESCRIPTIONS

- Route 7 - Lake East Corridor
- Station Type: Town center
- Site: Railroad Ave. between State and Elm Streets, Painesville
- Serves: Painesville, Perry, Fairport
- Current Land Use: Former train station
- Railroad: CSX Cleveland-Buffalo Line
- Configuration: Side platform
- Highway access: US 20, SR 86

CONSTRAINTS/OPPORTUNITIES

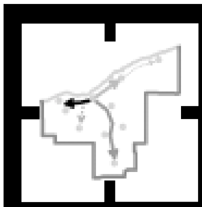
- Former station site, historic station building available for re-use
- Redevelopment opportunity
- Land available for park-and-ride lot
- Difficult highway access



STATION RATINGS
(relative to alternative locations)

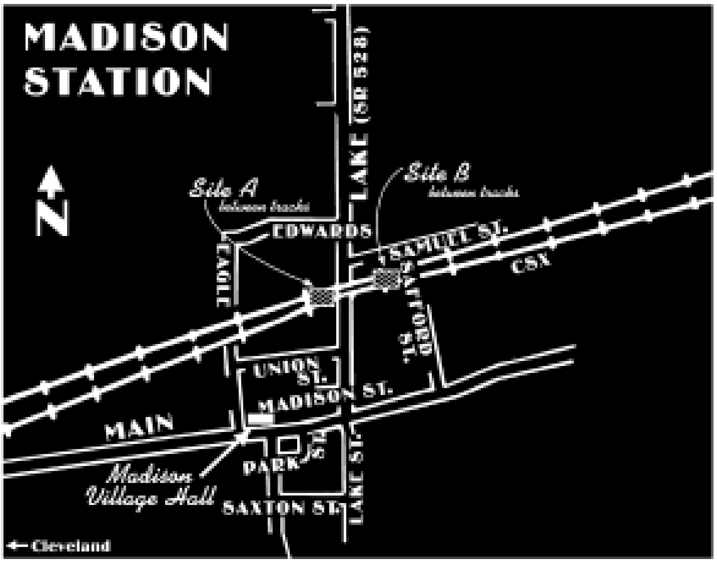
Access	○
Parking	◐
Cost	◐
Market (Origin)	◐
Market (Destination)	○
Implementation	◐

Scale: ○lowest (worst) ●highest (best)



Madison

LAKE ST. - SR 528

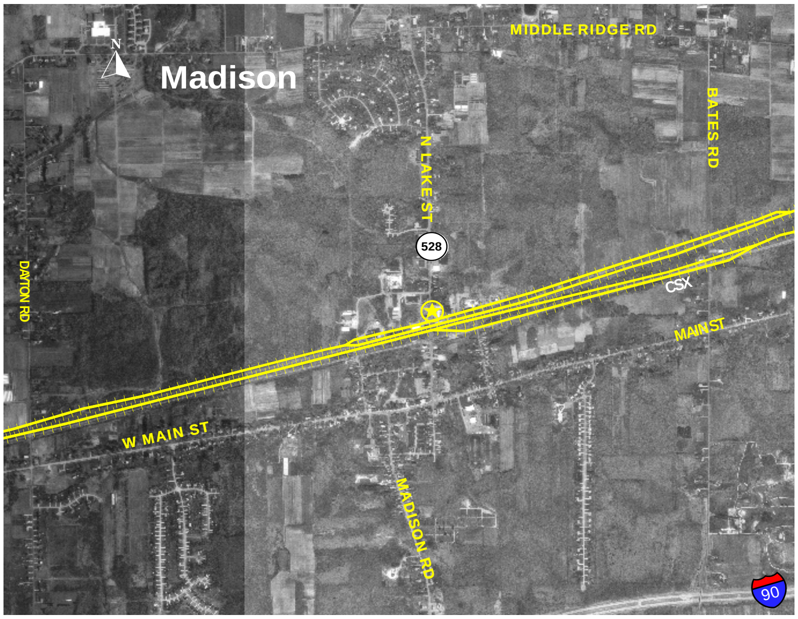


STATION DESCRIPTIONS

- Route 7 - Lake East Corridor
- Station Type: Town center, park-and-ride
- Site: Lake Street (SR 528), Madison
- Serves: Madison, Unionville, North Madison
- Current Land Use: Former train station
- Railroad: CSX Cleveland-Buffalo Line
- Configuration: Side platform
- Highway access: US 20, SR 84

CONSTRAINTS/OPPORTUNITIES

- Good highway access: I-90, US 20, SR 84, and SR 528
- Land available for park-and-ride lot
- Station location compatible with potential third track and future storage yard

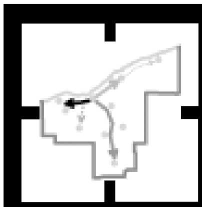


STATION RATINGS

(relative to alternative locations)

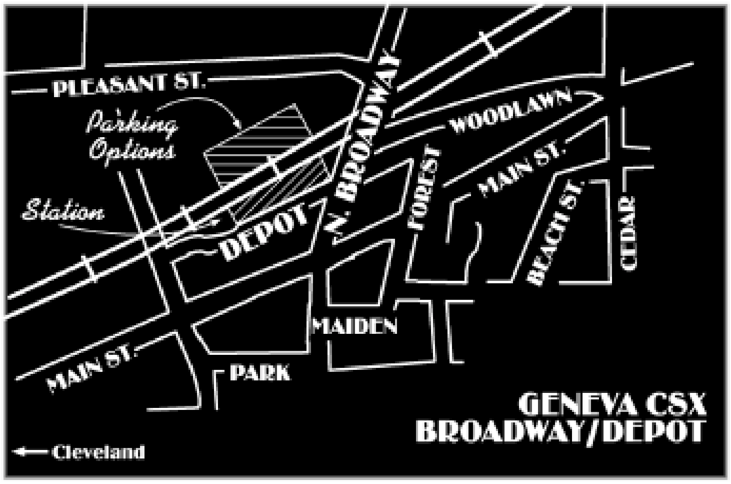
Access	◐
Parking	●
Cost	◐
Market (Origin)	◐
Market (Destination)	○
Implementation	◐

Scale: ○lowest (worst) ●highest (best)



Geneva

DEPOT ST. - SR 534

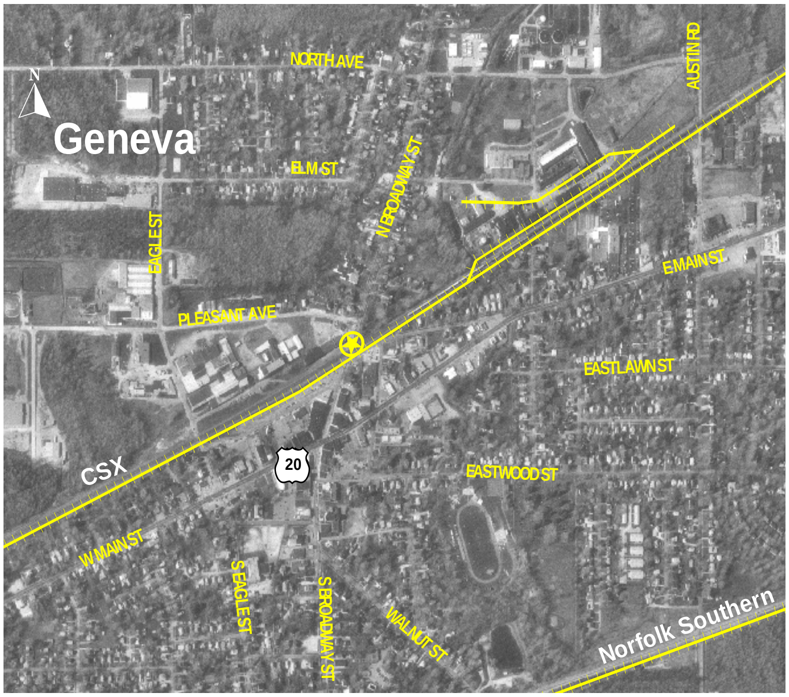


STATION DESCRIPTIONS

- Route 7 - Lake East Corridor
- Station Type: Town Center, park-and-ride
- Site: Depot St. and N. Broadway, Geneva
- Serves: Geneva, Geneva-on-the-lake, Harpersfield, Mechanicsville
- Current Land Use: Former train station
- Railroad: CSX Cleveland-Buffalo Line
- Configuration: Side platform
- Highway access: US 534, SR 84, US 20

CONSTRAINTS/OPPORTUNITIES

- Good highway accessibility: US 20, SR 84, SR 534
- Land available for park-and-ride lot
- Former train station
- Opportunities for station-area development

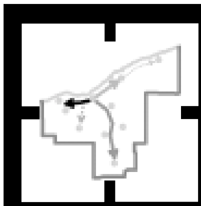


STATION RATINGS

(relative to alternative locations)

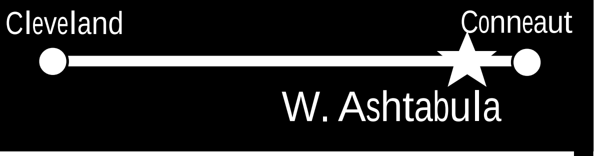
Access	◑
Parking	●
Cost	◑
Market (Origin)	◑
Market (Destination)	○
Implementation	◑

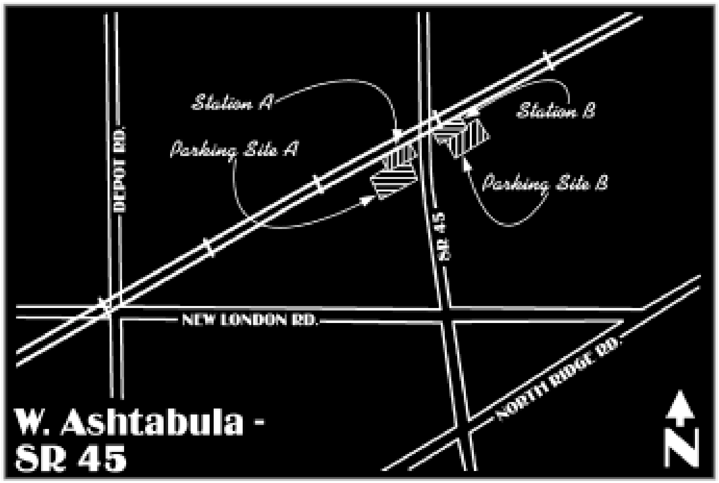
Scale: ○lowest (worst) ●highest (best)



West Ashtabula

SR 45



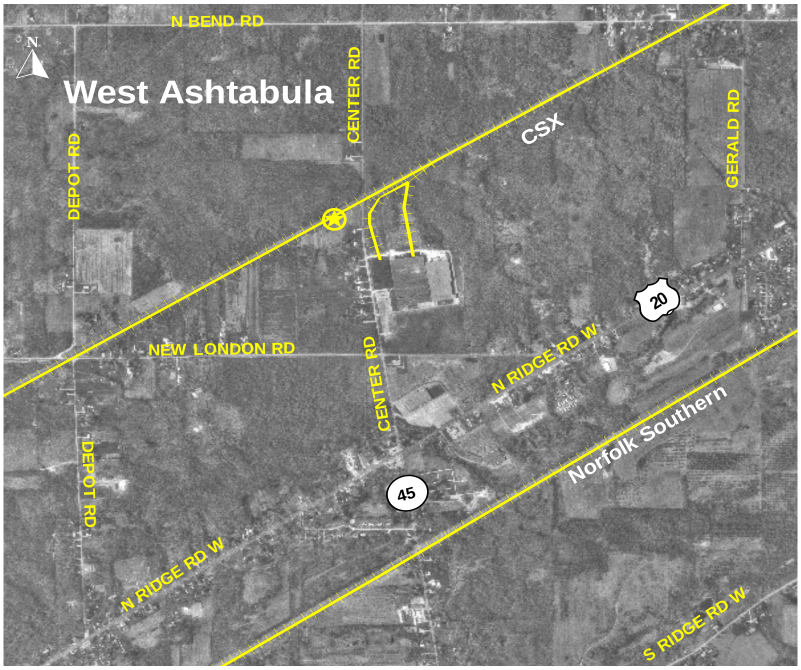


STATION DESCRIPTIONS

- Route 7- Lake East Corridor
- Station Type: Park-and-ride
- Site: SR 45, Saybrook
- Serves: Saybrook, Ashtabula
- Current Land Use: Vacant
- Railroad: CSX Cleveland-Buffalo Line
- Configuration: Side platform
- Highway access: SR 45, I-90

CONSTRAINTS/OPPORTUNITIES

- Better highway access than downtown Ashtabula site (SR 45 interchange with I-90)
- Land available for park-and-ride

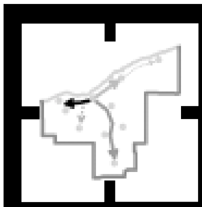


STATION RATINGS

(relative to alternative locations)

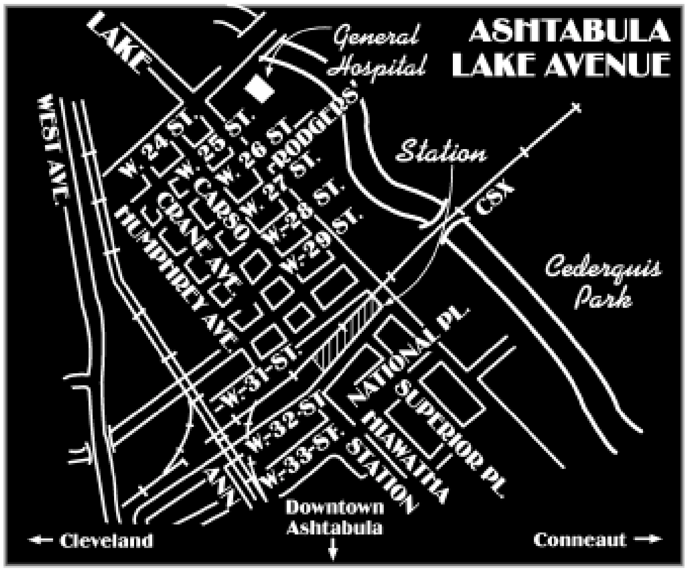
Access	●
Parking	●
Cost	○
Market (Origin)	◑
Market (Destination)	○
Implementation	◑

Scale: ○ lowest (worst) ● highest (best)



Ashtabula

LAKE AVE.

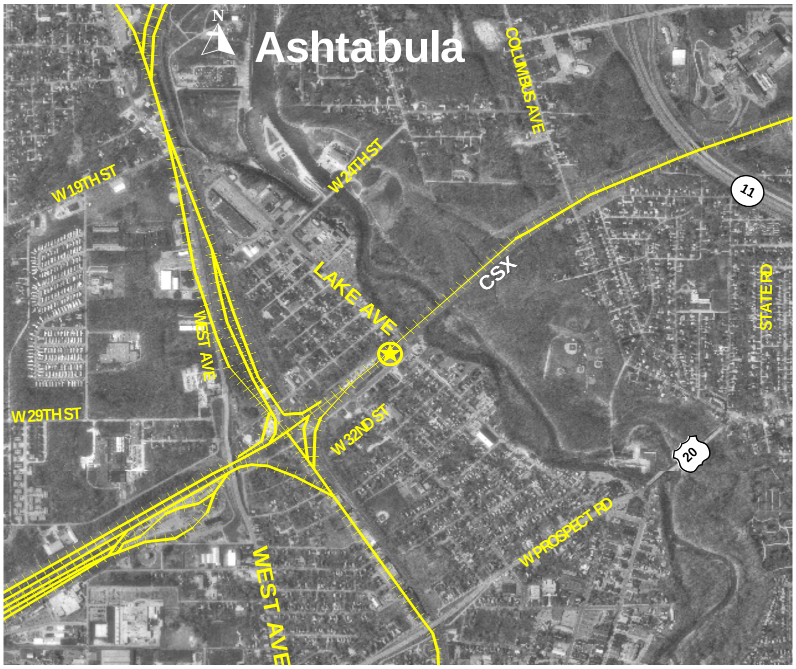


STATION DESCRIPTIONS

- Route 7 - Lake East Corridor
- Station Type: Town center
- Site: Lake Avenue, Ashtabula
- Serves: Ashtabula, Kingsville, Plymouth
- Current Land Use: Former train station
- Railroad: CSX Cleveland-Buffalo Line
- Configuration: Side platform
- Highway access: SR 11, SR 84

CONSTRAINTS/OPPORTUNITIES

- Potential development opportunities in station area
- Former station site
- Difficult highway access

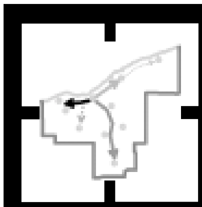


STATION RATINGS

(relative to alternative locations)

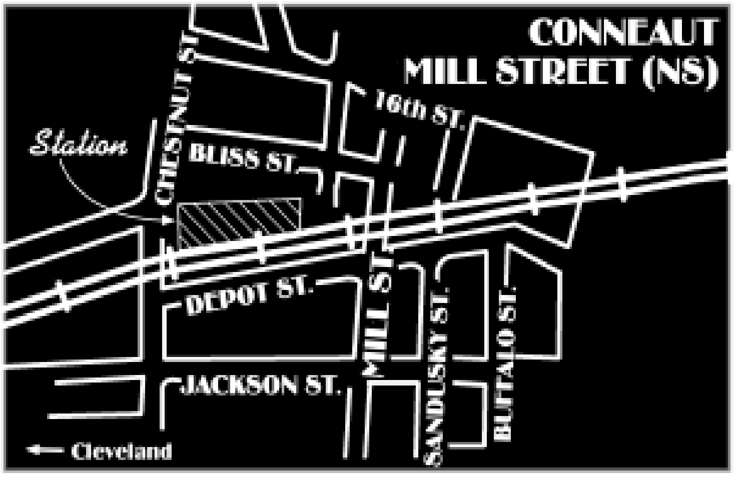
Access	○
Parking	◑
Cost	○
Market (Origin)	◑
Market (Destination)	○
Implementation	◑

Scale: ○lowest (worst) ●highest (best)



Conneaut

MILL ST.

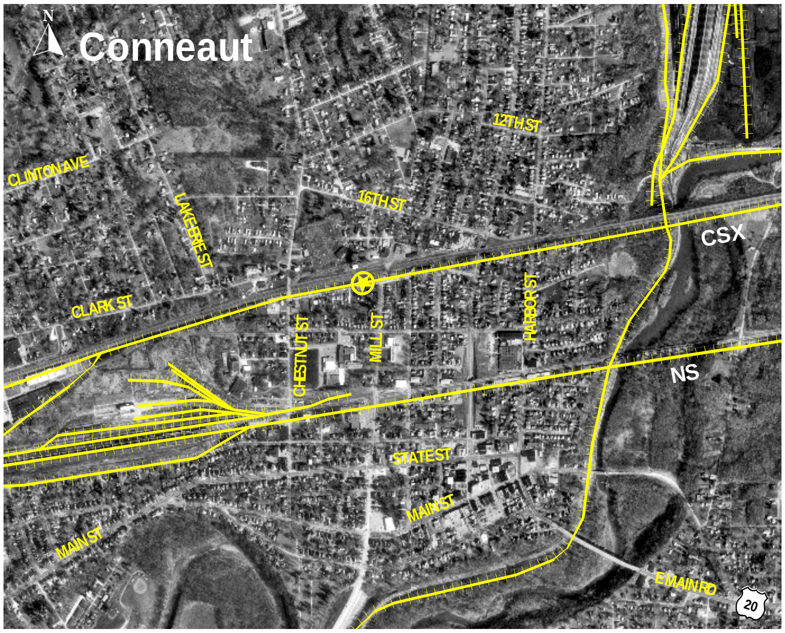


STATION DESCRIPTIONS

- Route 7 - Lake East Corridor
- Station Type: Town center
- Site: Depot St., between Mill & Chestnut Streets, Conneaut
- Serves: Conneaut, Eric Co. Pennsylvania
- Current Land Use: Former train station
- Railroad: CSX Cleveland-Buffalo Line
- Configuration: Side platform
- Highway access: SR 7, I-90

CONSTRAINTS/OPPORTUNITIES

- Potential development opportunities in station area
- Former station site
- Difficult highway access



STATION RATINGS

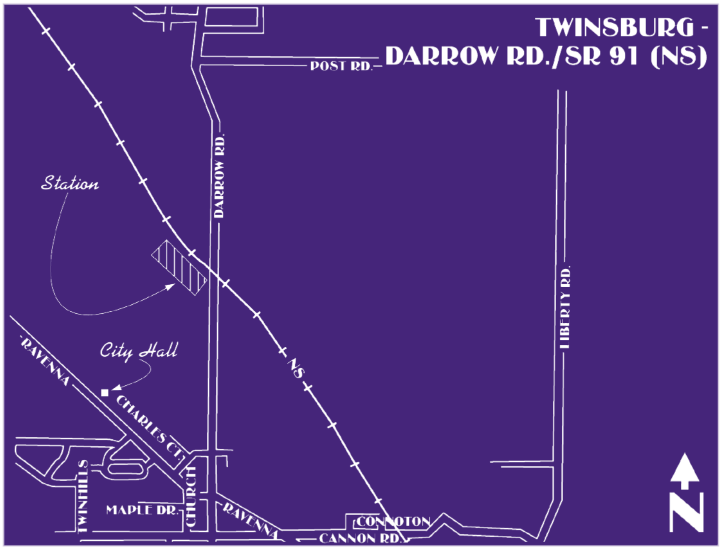
(relative to alternative locations)

Access	○
Parking	◑
Cost	○
Market (Origin)	◑
Market (Destination)	○
Implementation	◑

Scale: ○lowest (worst) ●highest (best)

Twinsburg
DARROW RD.

Cleveland Akron
Twinsburg

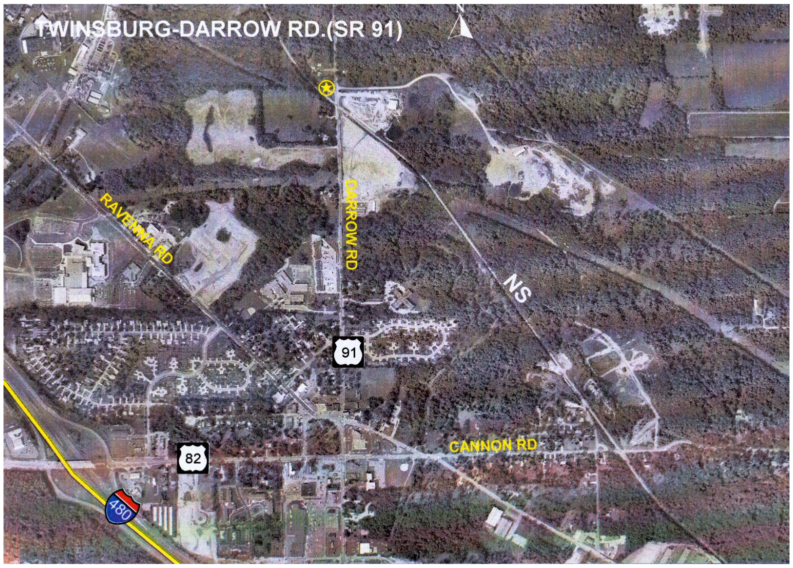


STATION DESCRIPTIONS

- Route: 5 - South Corridor via Kent
- Station Type: Park-and-Ride/Town Center
- Site: Darrow Rd./SR 91
- Serves: Twinsburg
- Current Land Use: Vacant
- Railroad: W&LE
- Configuration: Side Platform
- Highway access: SR 91, SR 82, I-480

CONSTRAINTS/OPPORTUNITIES

- Space available for station and park-and-ride lot
- Good highway access
- Local concerns regarding traffic & grade crossings



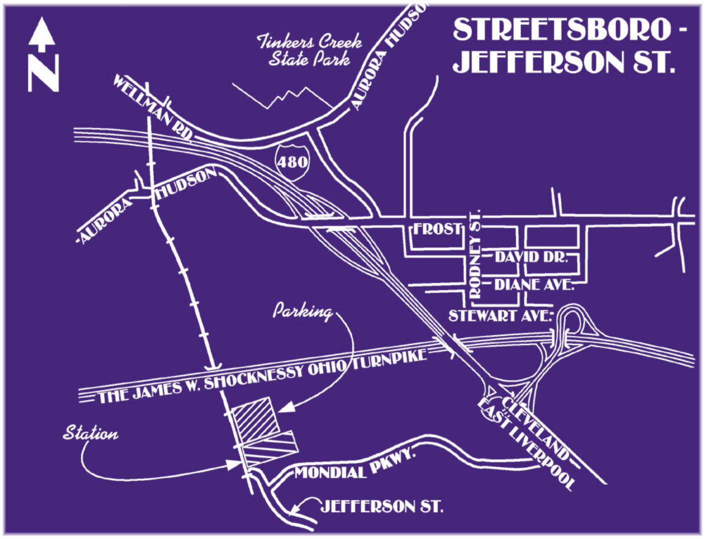
STATION RATINGS
(relative to alternative locations)

Access	◑
Parking	◑
Cost	◑
Market (Origin)	◑
Market (Destination)	◔
Implementation	◔

Scale: ○lowest (worst) ●highest (best)

Streetsboro

JEFFERSON ST.

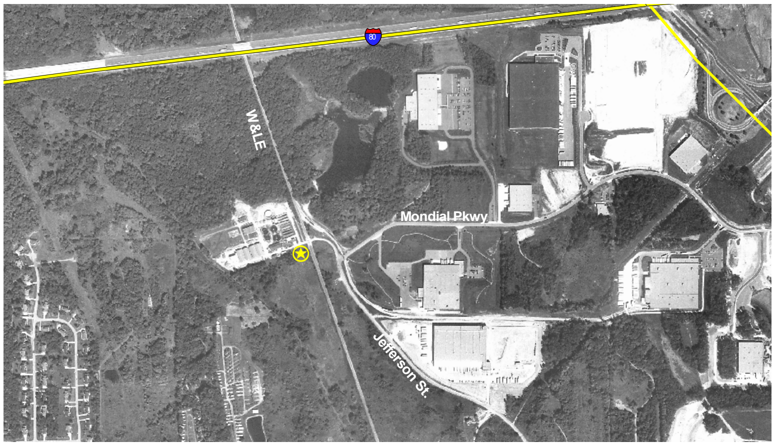


STATION DESCRIPTIONS

- Route 5 - South Corridor via Kent
- Station Type: Park-and-Ride
- Site: Jefferson St. & Mondial Pkwy. near I-480
- Serves: Streetsboro, Hudson
- Current Land Use: Vacant
- Railroad: W&LE
- Configuration: Side Platform
- Highway access: I-480, I-80, SR 14, SR 303

CONSTRAINTS/OPPORTUNITIES

- Space available for station and park-and-ride lot
- Good regional highway access, including the Ohio Turnpike
- Station area development potential



STATION RATINGS

(relative to alternative locations)

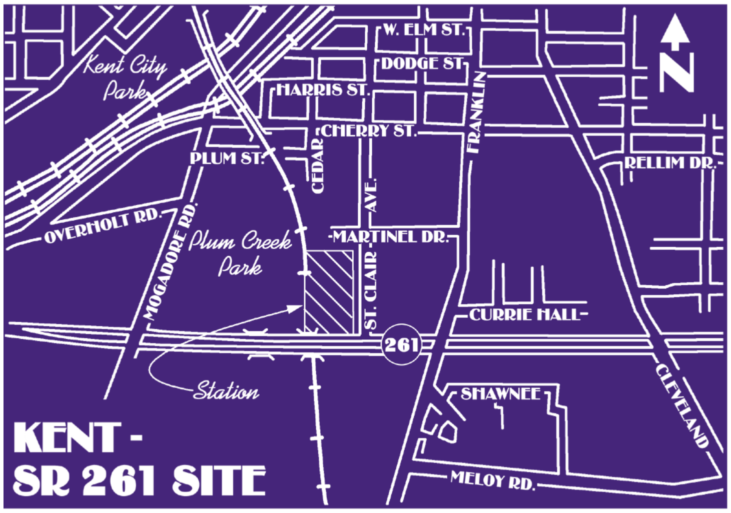
Access	◕
Parking	◕
Cost	◑
Market (Origin)	◑
Market (Destination)	◔
Implementation	◕

* As part of new development

Scale: ○lowest (worst) ●highest (best)

Kent

SR 261

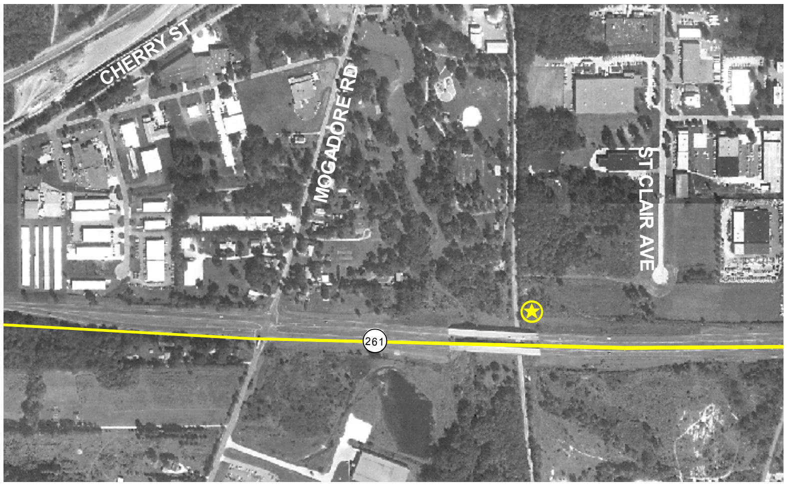


STATION DESCRIPTIONS

- **Route 5 - South Corridor via Kent**
- **Station Type: Park-and-Ride**
- **Site: Sr 261 at Plum Creek**
- **Serves: Kent, Franklin Twnshp, Ravenna**
- **Current Land Use: Open**
- **Railroad: W & LE**
- **Configuration: Side Platform**
- **Highway access: SR 261, SR 43, SR 59**

CONSTRAINTS/OPPORTUNITIES

- **Space available for station and park-and-ride lot**
- **Good regional highwy access**
- **Transfer shuttle required for access to down town and Kent State University**
- **Potential environmental issue (proximity to stream and parkland)**
- **Convenient location in terms of rail operations**



STATION RATINGS

(relative to alternative locations)

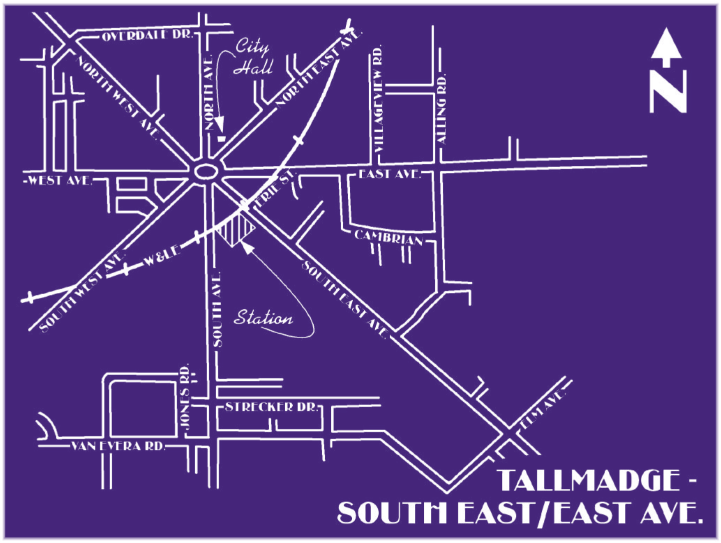
Access	◕
Parking	◑
Cost	◑
Market (Origin)	◕
Market (Destination)	◔
Implementation	◑

Scale: ○lowest (worst) ●highest (best)

CAC TRANS

Tallmadge
SOUTHEAST/EAST

Kent — Tallmadge — Akron

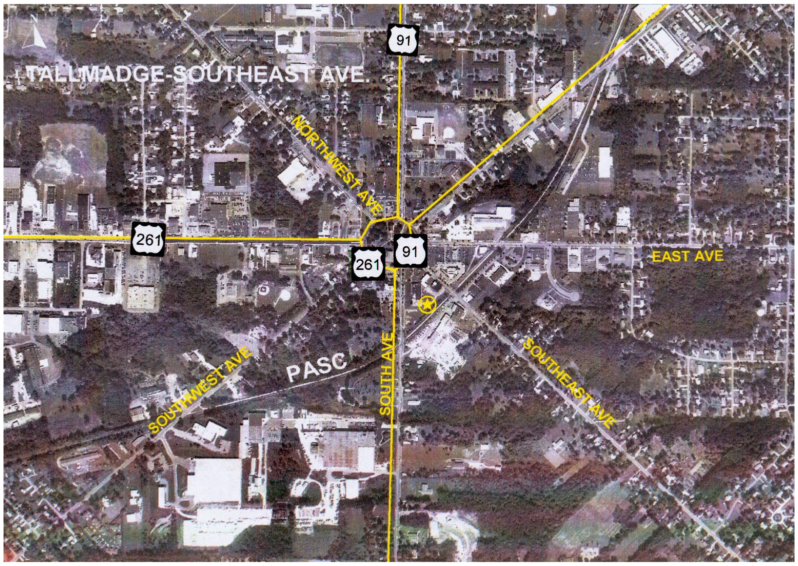


STATION DESCRIPTIONS

- **Route 5 - South Corridor via Kent**
- **Station Type: Park-and-Ride, Town Center**
- **Site: South/Southeasat Ave.**
- **Serves: Tallmadge, Mogadore**
- **Current Land Use: Commercial**
- **Railroad: METRO**
- **Configuration: Side Platform**
- **Highway access: SR 91, SR 261, I-76**

CONSTRAINTS/OPPORTUNITIES

- **Space available for station and limited park-and-ride lot**
- **Good local highway access**
- **Station area development potential**
- **Local traffic and grade crossing issues**



STATION RATINGS

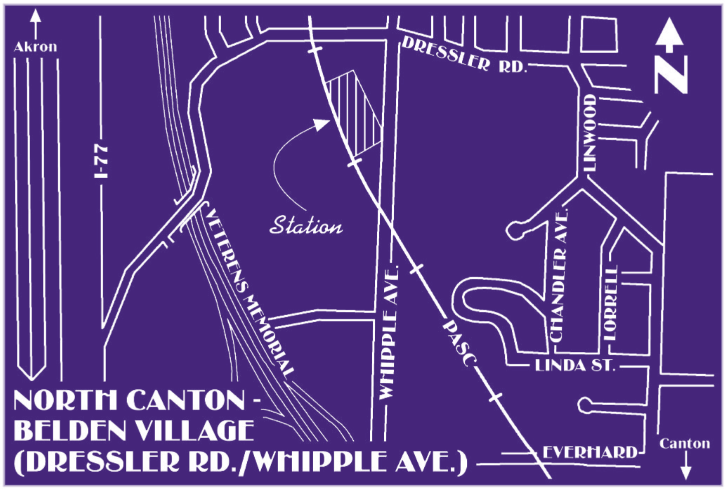
(relative to alternative locations)

Access	◕
Parking	◑
Cost	◑
Market (Origin)	◑
Market (Destination)	◔
Implementation	◑

Scale: ○ lowest (worst) ● highest (best)

Belden Village

DRESSLER RD.

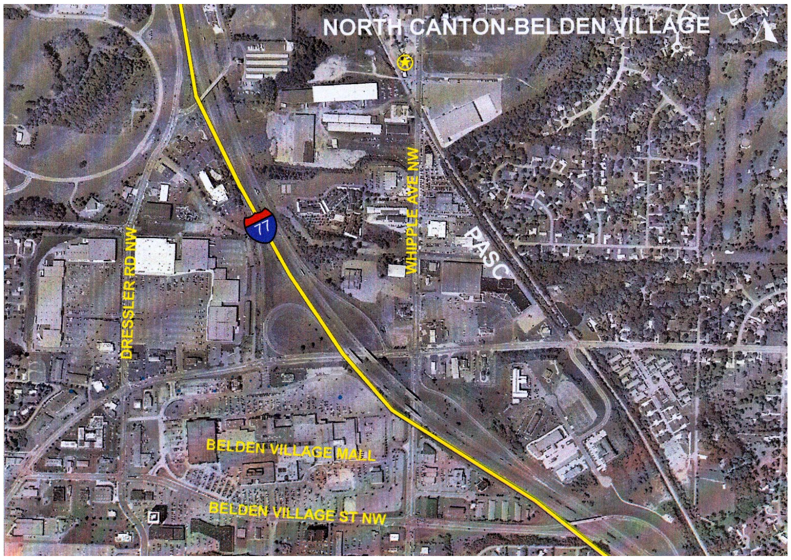


STATION DESCRIPTIONS

- **Route: CAC Phase II**
- **Station Type: Park-and-Ride**
- **Site: Dressler Rd./Whipple Ave.**
- **Serves: North Canton, Jackson Twnshp**
- **Current Land Use: Industrial/Commercial**
- **Railroad: METRO**
- **Configuration: Side Platform**
- **Highway access: I-77, SR 297**

CONSTRAINTS/OPPORTUNITIES

- **Sufficient space for station and park-and-ride lot**
- **Good local highway access**
- **Proximity to existing commercial center**
- **No existing transfer service to shopping center**



STATION RATINGS

(relative to alternative locations)

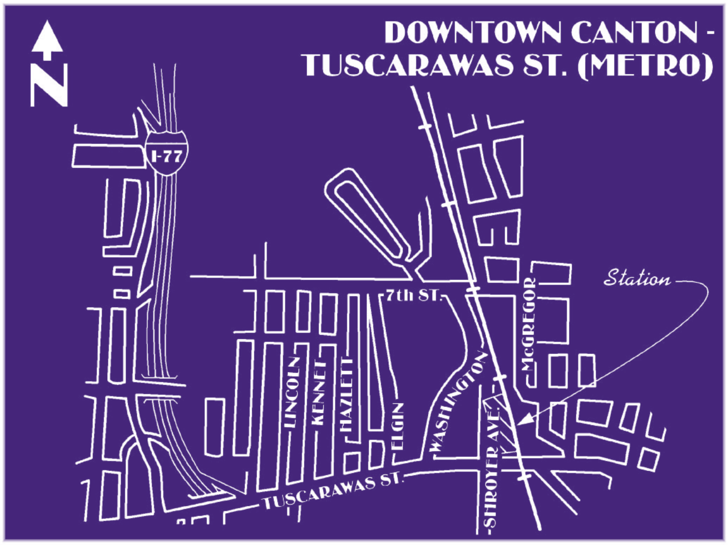
Access	◕
Parking	◑
Cost	◑
Market (Origin)	◑
Market (Destination)	◑
Implementation	◑

Scale: ○lowest (worst) ●highest (best)

Downtown Canton
TUSCARAWAS ST.

Akron

Canton

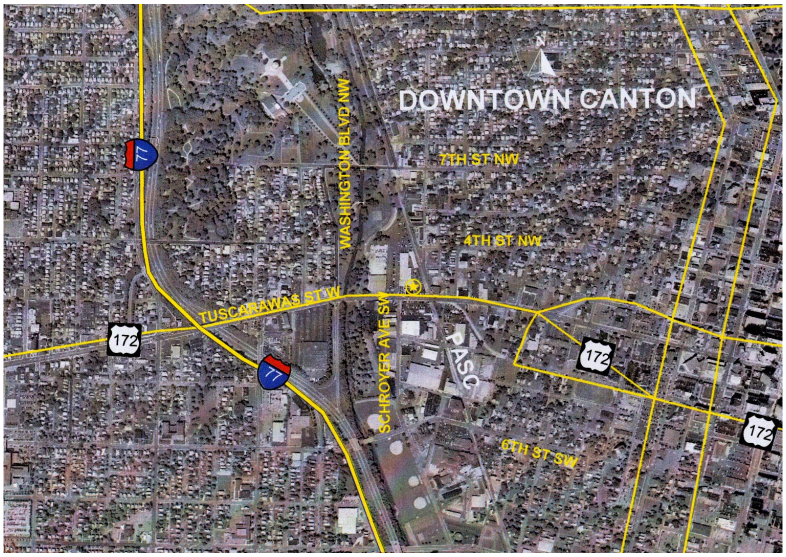


STATION DESCRIPTIONS

- **Route: CAC Phase II**
- **Station Type: Park-and-Ride, Town Center**
- **Site: Downtown Canton**
- **Serves: Canton, Green**
- **Current Land Use: Commercial**
- **Railroad: METRO**
- **Configuration: Side Platform**
- **Highway access: I-77, US 62, SR 43**

CONSTRAINTS/OPPORTUNITIES

- **Serves Dowtown Canton**
- **Limited space for park-and-ride lot**
- **Sufficient space for station**
- **Station area development potential**



STATION RATINGS
(relative to alternative locations)

Access	◑
Parking	◔
Cost	◑
Market (Origin)	◔
Market (Destination)	◔
Implementation	◑

Scale: ○lowest (worst) ●highest (best)